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The Massachusetts Medical Society

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WHAT WE HAVE LEARNED FROM THE TOAD CONCERNING HYPOPHYSEAL FUNCTIONS*

BY BERNARDO A. HOUSSAY, M.D.§

THERE are three reasons which justify the dedication of my first lecture to such a humble living creature as the toad: (1) because, more than twenty-five years ago, my first publication in *Physiology* was on the pituitary of amphibians; (2) because the toad is the species in which the largest number of functions related to the pituitary has been found and studied; and (3) because hormonal actions are not species specific, but have a fundamental similarity throughout the vertebrate series.

To these reasons others may be added which justify the use of this animal, as I can well appreciate after experimenting on more than 15,000 toads of the species *Bufo arenarum* Hensell.† Such are, its abundance and cheapness, its resistance to trauma, the facility of operative techniques, the great number and clarity of the symptoms of pituitary insufficiency, the rapidity and intensity of the reaction to implantation of any of the lobes of the pituitary, and the possibility of making experiments and obtaining proofs more easily and in larger numbers than with any other animal. For these reasons we have preferred to employ the toad rather than the frog, *Leptodactylus ocellatus* (L.) Gir, common to our country, which we studied in 1910-1916 and in 1924 but which is much less resistant.‡

Let us remember that the amphibian pituitary consists of four parts:[17, 18, 40, 75] (Figs. 1 and 2)

(1) The principal lobe (distal, chromophile or *pars glandularis*) which corresponds to the anterior lobe of the mammalian pituitary, but which lies posteriorly in amphibians.

(2) Intermediate part (proximal or chromophobe, *pars intermedia*).

(3) Neural part (nervous or neurohypophysis, *pars nervosa*).

(4) Tuberal part (*pars tuberalis*) which, however, we have not been able to identify in *Bufo arenarum* Hensell.

The intermediate and neural parts are closely united forming a lobe which is equivalent to the posterior lobe in mammals, although here it is anterior and may be called the *intermedioneural lobe*. The principal lobe can readily be extirpated whole; if afterwards the neuro-intermediate part is extirpated, the hypophysectomy is total. The pituitary is situated caudo-ventral to the infundibular lobe of the brain. The latter is a prolongation of the hypothalamus, behind the optic chiasm and may be designated as the *infundibulotuberal region*.

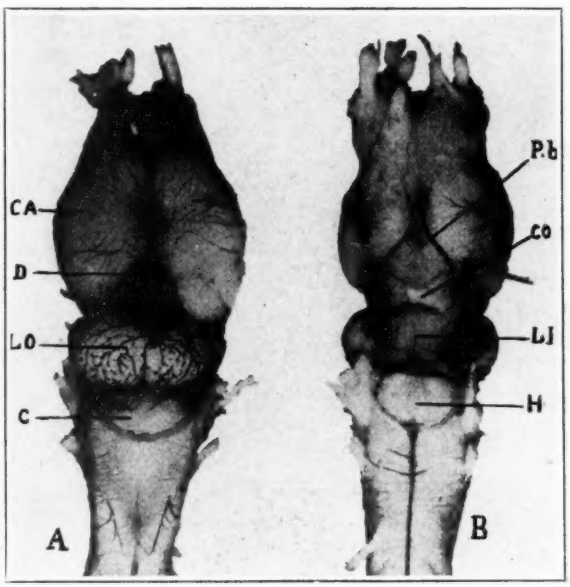


FIG. 1. Brain of *Bufo arenarum* (Hensell).

A.—Dorsal view: C.A. Anterior cerebrum (Hemispheres).
D. Diencephalon (thalamus opticus).
L. O. Optic lobes.
C. Cerebellum.

B.—Ventral view: P.b. Pars basalis of Lamina terminalis
C. O. Optic chiasm.
L. I. Lobus infundibularis.
H. Principal lobe of the Hypophysis.

The functions of the pituitary and of the tuberal region are studied by producing lesions or by implantations. The following techniques were systematically applied to the study of each function: (1) Trans-sphenoidal extirpation of the principal lobe only or of the entire pituitary.[16, 17, 18] (2) Puncture with a needle, or cauterization of the infundibulotuberal region,

*Dunham Lecture delivered November 22, 1935 at the Harvard Medical School.

†In the first works we published we called this toad *Bufo marinus*, but since 1930 we have corrected this zoölogical error.

‡We have observed with only slight differences symptoms generally analogous in *Leptodactylus ocellatus* (L.) Gir (Houssay,[17 18] Houssay and Ungar,[51 52]), *Bufo marinus*, *Bufo paracnemis*, *Bufo D'Orbigny*, *Ceratophrys ornata*, *Hyla sp.*, etc.

§Houssay, Bernardo A.—Professor of Physiology, Faculty of Medical Sciences, University of Buenos Aires 1919-. For record and address of author see "This Week's Issue," page 946.

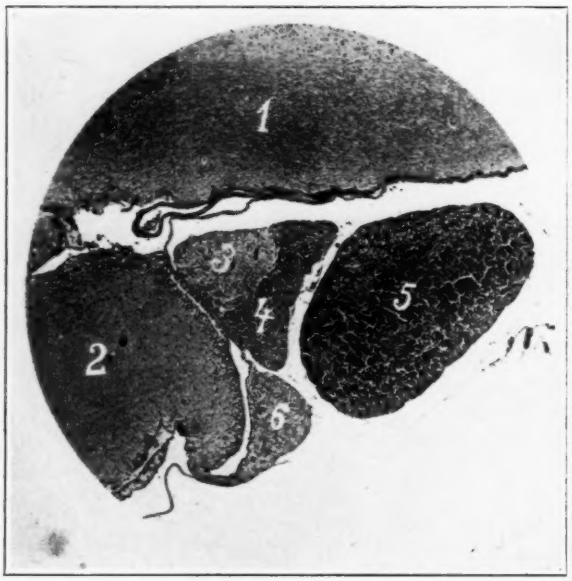
either posterior or anterior to the optic chiasm.* For cauterization a hot needle or the galvanocautery was used. (3) Subcutaneous implantation of the entire toad pituitary, or of the principal and neuro-intermediate lobes separately.

*The supra-optic nucleus is situated deeply in front of the chiasm; it is fairly large and sends fibres to the pituitary. (Greving, 1928; Scharrer, 1934; Carrillo, unpublished.)

(4) Injection, separately, of extracts of the same lobes or of extracts of the anterior, neural or intermediate parts of mammalian or other vertebrate pituitaries.

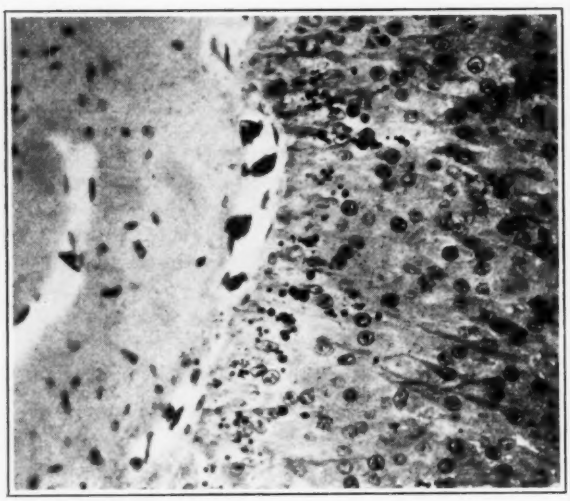
The symptoms which can be observed in the toad are referable to the following systems and processes: the skin; the genitalia; the circulatory system; the endocrine system; the neuromuscular system; gaseous exchange; nitrogen, carbohydrate and water metabolism; sensitivity to poisons; rate of mortality; etc. These have all been studied in our Institute and the results published in more than eighty papers.*

*For previously published summaries of this work see references 25, 35, 37.

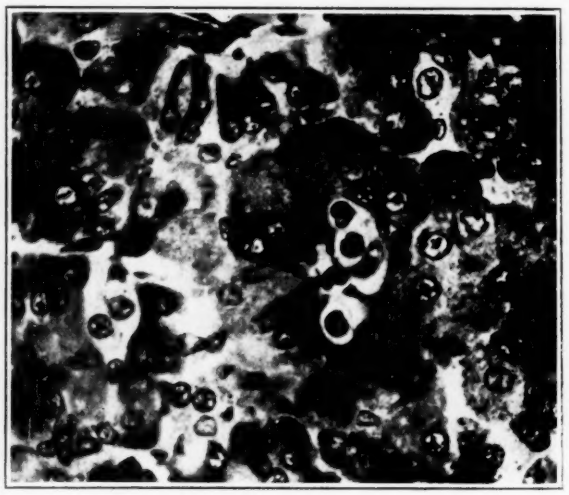


A

B



C



D

FIG. 2. A. Microphotograph of the mid-sagittal section through the hypophysis of the frog. *Leptodactylus ocellatus* (L.) Gir. 1. Base of the brain. 2 and 6. Lobus infundibularis. 3. Pars nervosa. 4. Pars intermedia. 5. Pars principalis.

B. Microphotograph of a section through the pars neurointermedia of the hypophysis of a toad 70 days after extirpation of the principal lobe.

C. Microphotograph at high magnification of a section through the pars nervosa (left) and pars intermedia (right) of the hypophysis of a toad to show colloid droplets.

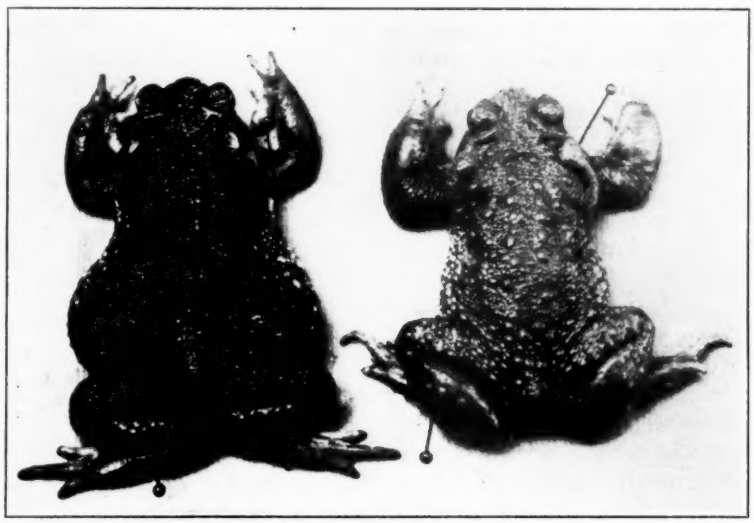
D. Microphotograph of a section showing the chromophile and chromophobe cells in the pars principalis of the hypophysis of the toad.

The syndromes which have so far been described may be classified in four large groups according to their etiology: (1) pituitary insufficiency, (2) pituitary hyperactivity, (3) infundibulotuberal syndromes, (4) infundibulohypophyseal syndromes.

PITUITARY INSUFFICIENCY

Insufficiency of the intermedioneural lobe.

These symptoms become manifest within a few minutes or hours after total hypophysectomy. They do not occur if only the principal lobe is extirpated or with lesions of the Lobus infundibularis of the brain. The implantation or injection of either lobe will correct the disorders, but the neuro-intermediate lobe is the most active. The symptoms are:



A B

FIG. 3.

Unretouched photographs of toads. A. Injected with bovine posterior lobe, showing the dark color due to the expansion of melanophores. B. Hypophysectomized, showing the typical cutaneous pallor.

(a) *Cutaneous pallor*[16, 52, 83] due to contraction of the melanophores and expansion of the xantophores. (Fig. 3.) This pallor disappears on injection of extracts of the toad's intermedioneural lobe, or of extracts of the neural or of the intermediate parts of the mammalian pituitary. Of the last two, the second is the more active. Extracts of the anterior lobe of the mammal, or of the principal lobe of the toad, can produce darkening but are much less active and, in the case of the toad extract, seven times less potent than the neuro-intermediate lobe extract.*

(b) *Polyuria.*[38, 72] This is intense and persistent in 70 per cent of toads after total hypophysectomy. After removal of the principal lobe alone it is less frequent, occurring in only 33 per cent. It is rare and transient after tuberal lesions. It can be arrested by injection of toad neuro-intermediate lobe or mammalian posterior lobe. The polyuria is of renal origin as it is not observed in toads unless they are immersed in water. Absorption of water by the skin[77] is performed at the same rate in nephrectomized toads and in those with ureters tied, whether they be hypophysectomized or normal controls. The recent experiments of Pasqualini have induced the writer to abandon the belief that the polyuria is a tuberal symptom.

(c) *Fall in arterial pressure.*[69] If the whole gland is removed this is rapid, intense and progressive. The fall begins within a few hours after operation and continues progressively from 30 mm. of mercury to 24 mm. in a week and 17 mm. in a month. Extirpation of the principal lobe alone does not cause this hypotension, although a slight fall of blood pressure appears later on when asthenia develops. There is no fall of blood pressure with lesions limited to the infundibulotuberal region. The injection of neuro-intermediate or of glandular lobe causes the blood pressure to rise, the glandular lobe being less active.[17, 39, 69] Although the total amount of blood is almost the same in hypophysectomized toads as in the normal controls less can be obtained by bleeding the former, because it remains in the blood vessels. The circulating blood has fewer red blood corpuscles (Varela and Sellarés, 1934; Parodi, unpublished), and there is leucopenia with a decrease of the polymorphonuclear cells and of the monocytes. (Varela and Sellarés, 1934.)

(d) *Dilatation of the capillaries.*[3, 84] This can

*Allen has shown that only the *pars intermedia* is active in other species of amphibia.

always be observed in the skin when the entire pituitary is extirpated but it is less constant and intense when the principal lobe alone is removed or the *Lobus infundibularis* of the brain injured.

Insufficiency of the principal lobe.

Following the extirpation of the principal lobe only (which corresponds to the anterior pituitary of mammals) characteristic symptoms slowly develop. These symptoms appear slightly more rapidly after removal of the whole pituitary, but they do not occur after simple lesions of the *Lobus infundibularis.* The morphogenetic and sexual symptoms are compensated only by administration of the principal lobe; the metabolic and general symptoms by both lobes, though the principal lobe is always more active.

I. *Morphogenetic and endocrine regulatory functions.*

(e) *Retardation and cessation of growth* have been described in other amphibians by Allen (1916), Smith and others, but we have not studied this point in *Bufo arenarum.*[cf 55]

(f) *The thyroid epithelium* shows signs of atrophy.[58, 59] It becomes flattened, the vesicles very large and the colloid homogeneous and readily stainable (see fig. 11).

(g) We have not been able to confirm with certainty the *atrophy of the adrenal cortex* seen by Smith (1920) in tadpoles; the medullary part is not altered and its adrenalin content is not lowered.[47]

II. *Sexual and reproductive functions.*

(h) *Testicular atrophy.*[15, 16, 36, 37, 40, 41] The testes weigh less than in the controls, and there is atrophy of the seminiferous epithelium and interstitial tissue. There is no compensatory hypertrophy after subtotal castration.[26]

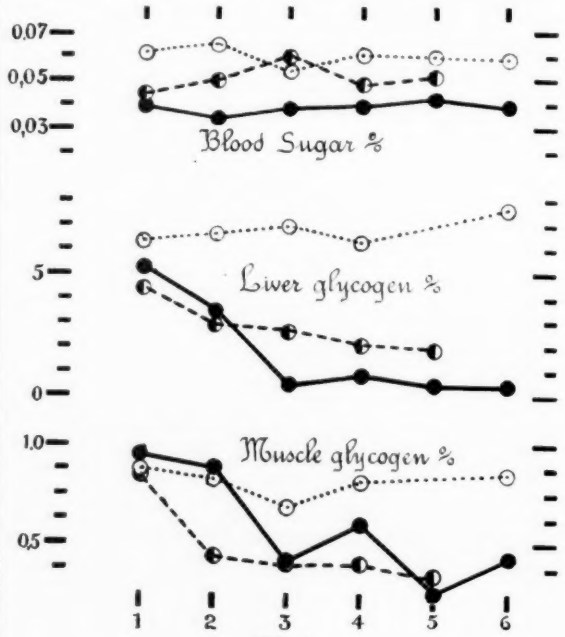


FIG. 4.

Chart showing the effect of removal of the principal lobe of the hypophysis (broken and solid lines) in the toad on the concentration of blood sugar, liver and muscle glycogen as compared with normal controls (dotted lines).

(i) *Atrophy of Bidder's organ*[41, 43], occurs both in castrated animals and in those with intact sex glands, and there is no compensatory hypertrophy in the castrates.

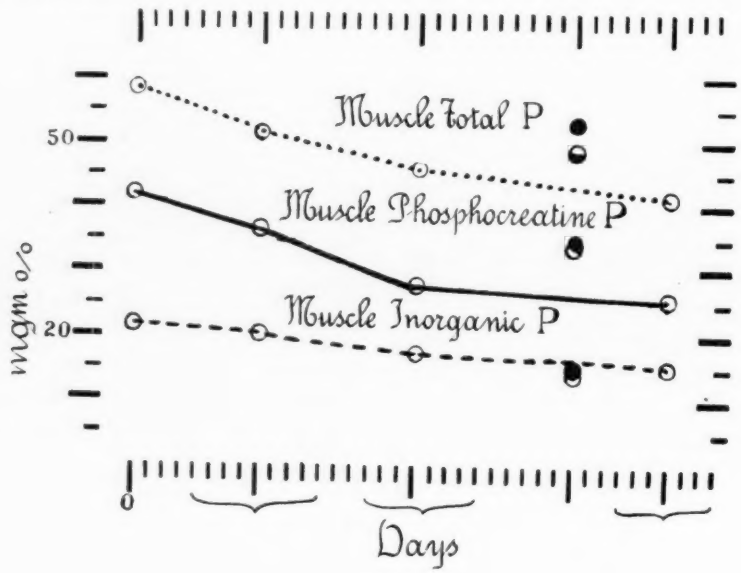


FIG. 5.

Chart showing decrease in the total phosphorus, phosphocreatine phosphorus and inorganic phosphorus in the muscles of the toad following removal of the principal lobe of the hypophysis.

(j) *Ovulation** fails to occur even in the mating season and with the normal sexual stimulation, namely the sexual embrace.

III. *Metabolic functions.*

(k) *The consumption of oxygen* does not diminish† until asthenia is marked.

(l) The concentration of *blood sugar* and the glycogen content of the liver[27, 34, 48] and heart[70] are progressively lowered. Later the muscle glycogen also decreases.[27, 34, 48] (Fig. 4.)

(m) *Phosphocreatine* and *glutathione* in muscle[60, 62] (figs. 5 and 6) and the glutathione of the liver are diminished. The basal *lactic acid*[61] is normal, but during muscular activity it increases less than in the controls.

(n) The *hyperglycemias following injection of adrenalin or morphine* are less marked than in the controls.[33]

(o) *Pancreatic diabetes*, which is intense in the controls, is less severe and may even fail to appear.[5, 7, 28, 29, 30, 32, 45 *]

(p) *Phlorhizin glycosuria* is less marked and may not occur.[11] However, hypoglycemia and convulsions develop and there is a high mortality.

(q) Sensitivity to the hypoglycemic and toxic actions of *insulin*[49,50] is marked, whereas sensitivity to other toxins is not changed.[17]

*Orias[68] has observed the same phenomenon in the fish, *Mustelus canis*, and Houssay and Biasotti[30] in other amphibia and reptiles.

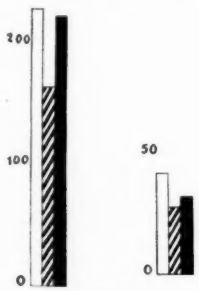


FIG. 6.

Chart showing the decrease in glutathione in the liver and muscle of the toad following removal of the principal lobe of the hypophysis and its restitution by injection of extract of bovine glandular (anterior) lobe.

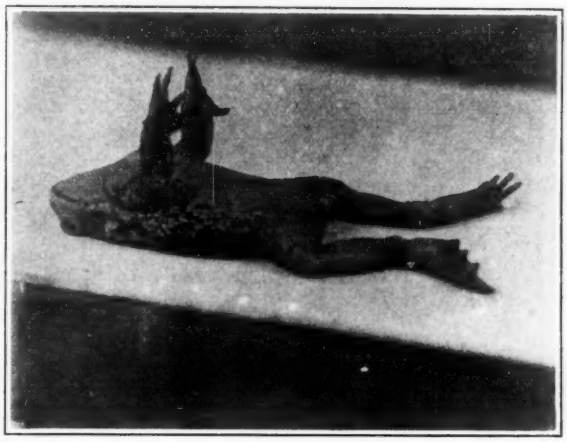
Normal

Hypophysectomized

Hypophysectomized and injected with glandular lobe extract of beef hypophysis.

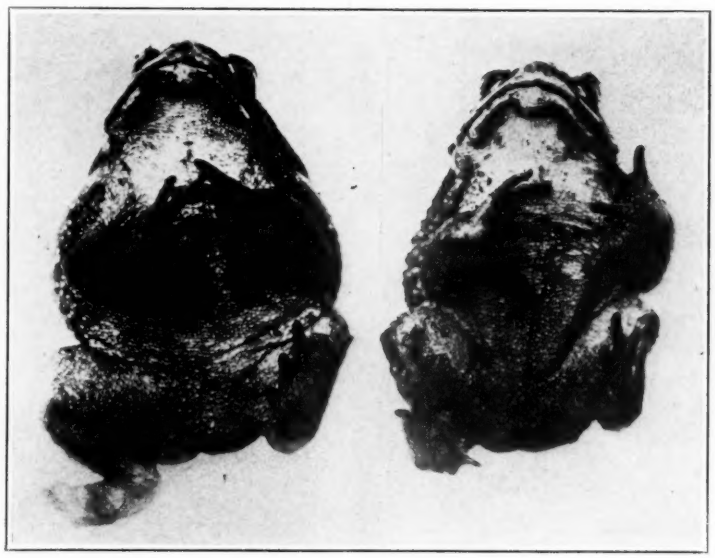
*See reference 25. Further proof of this, however, is necessary.

†Data obtained by Artundo, published by Houssay and Giusti.[35]



A

FIG. 7.



B

FIG. 7.

Figs. 7 A and B are unretouched photographs showing the state of *asthenia hypophysopriva* in the toad after removal of the principal lobe of the hypophysis. A. The earliest symptom, inability to regain the normal posture when laid upon its back. B. Typical posture at a later stage.

(r) Lowered elimination of *urinary nitrogen* during fasting has been observed. It may be 30 per cent less than in the controls.[6]

IV. *General symptoms, probably metabolic.*

(s) There is great sensitivity to slight *operations* and *traumata*, and the mortality rate is high.[2, 25, 26, 59, 72]

(t) Marked *neuromuscular asthenia* appears, which is progressive and finally fatal.[9, 14, 15, 16, 17, 18, 24, 25, 35, 36, 76] (Fig. 7.) This commences fifteen to twenty-five days after operation, the first symptom being the inability of the toad to turn over when placed on its back. Later there is slowness of movement and progressively increasing weakness. Convulsions occur in 5 to 10 per cent of the cases. The mortality is highest during the fourth to the seventh weeks, and very few animals live as long as three to five months. When the asthenia begins there is

A

B

C

D

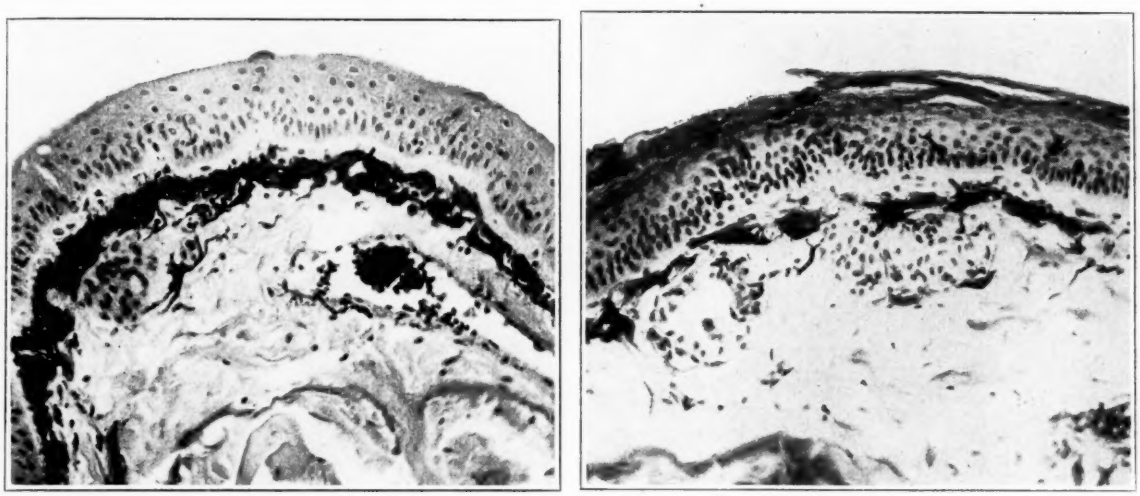
FIG. 8.

Unretouched photographs showing the hyperkeratinization in hypophysectomized toads. A and B. Dorsal and ventral views of normal toads (female). C and D. Dorsal and ventral views of hypophysectomized toads (female).

diminished excitability of the sensory reflexes, but the chronaxie of the nerve and muscle continues unaltered.9*

(u) *Cutaneous hyperkeratinization.* There is formation of a thick horny layer which is adherent to the skin.[2, 13, 14, 15, 16, 25, 35, 36, 37, 76] The skin becomes covered by a dark brown or bronze cuticle, due to an exaggerated production and a failure of normal desquamation of the horny layers.[1, 2] (Figs. 8 and 9.)

Symptoms j, m, n, p, q, appear immediately after operation, u in three to eight days and l, t, v and w in from fifteen to twenty-five days. All these symptoms, particularly the metabolic and general ones, can be prevented or corrected by the implantation of the principal lobe of the toad or of mammalian anterior lobe.* The sexual modifications are only influenced by the toad pituitary and to a lesser extent by that of other amphibians.†



A B

FIG. 9.

Microphotographs of the skin of a normal toad, A, as contrasted with that of a hypophysectomized toad, B. Note the thick cuticle of the latter, and the contracted state of the melanophores.

(v) The *cutaneous secretions* are greatly diminished.[1, 2]

(w) There is slowing of the *heart*, decrease of its glycogen content and rise in its chronaxie.[10, 70] After some time in a few of the toads the cardiomoderating action of the vagus is diminished, or may even be totally suppressed.[50, 56]

*Evidence for the central origin of the asthenia is furnished by the facts that the first indications of this symptom are alterations of the postural reflexes and reflex excitability, and also that there may be convulsions. Further, the motor nerve and muscle excitability is not affected until later, and then only slightly.[9] The peripheral factor is less important.[9 16 35]

PITUITARY HYPERACTIVITY

This is brought about by implantation of either lobe or by injection of toad pituitary extracts or extracts of mammalian pituitary. In general these symptoms are the opposite of those of pituitary insufficiency.

*The thyrotropic function of the latter is doubtful and the sexual is absent in this toad.

†Although other amphibia respond to the sexual activating principle of mammalian pituitary this toad is unaffected, a fact which up to now has remained without satisfactory explanation.

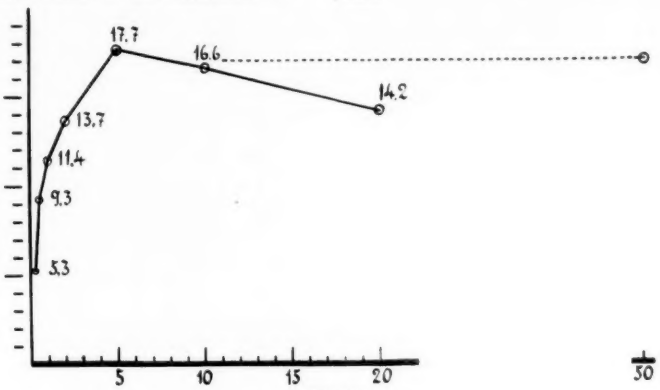


FIG. 10.

Graphic representation of the increase in weight of toads injected with graded doses of dry bovine posterior lobe.
Ordinates, percentage increase in weight.
Abscissae, milligrams of dry bovine posterior lobe injected.

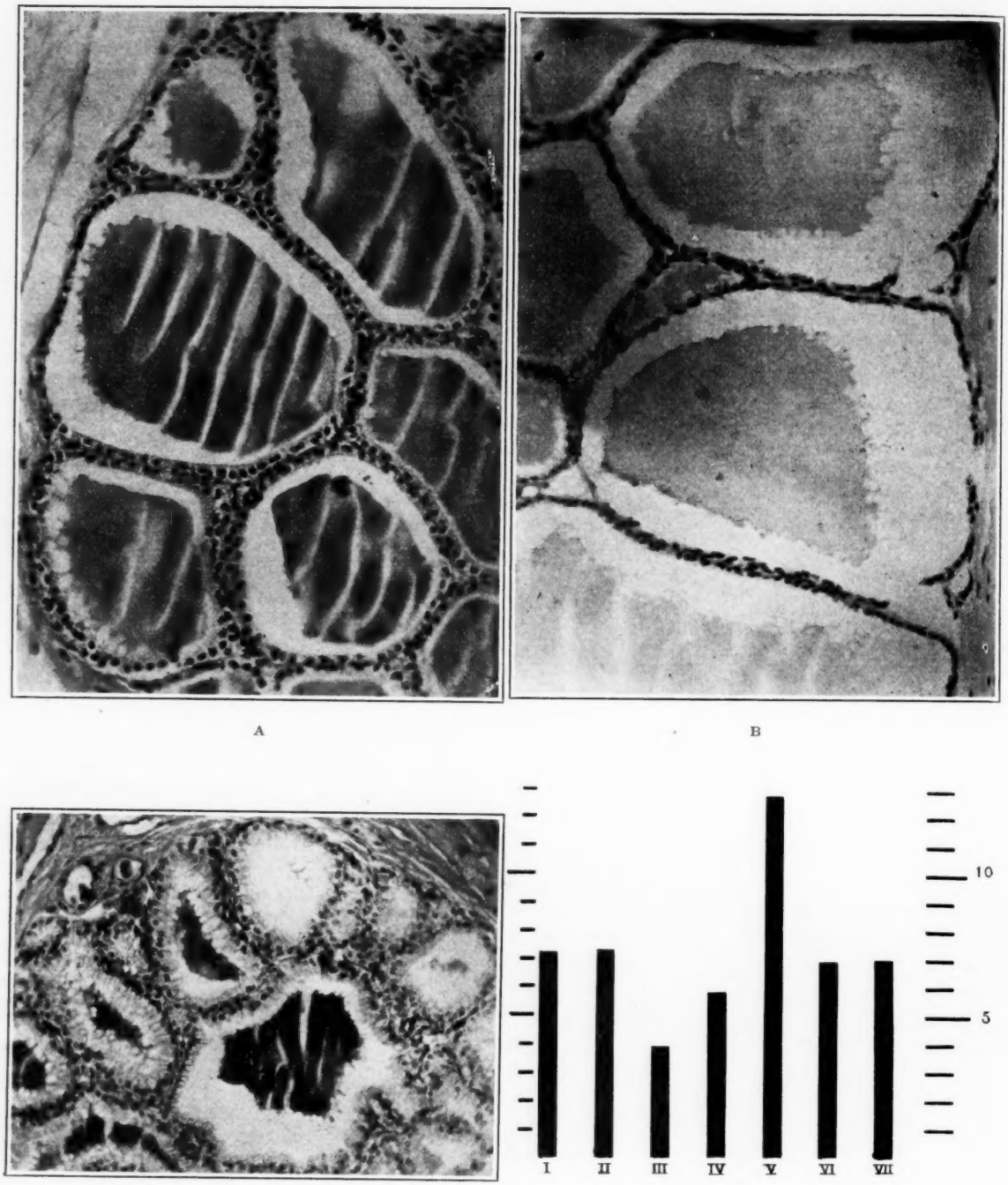


FIG. 11.

A. Microphotograph of a section through the thyroid of a normal toad.

B. Microphotograph of a section through the thyroid of a hypophysectomized toad.

C. Microphotograph of a section through the thyroid of a toad which had received implantation of the principal lobe of the hypophysis.

D. Graphic representation of the height of the thyroid epithelium in toads under different experimental conditions.

I. Normal. II. Craniotomized. III. Hypophysectomized. IV. Following cauterization of the tuber. V. Following implantation of principal lobe. VI. Following implantation of neuro-intermedial lobe. VII. Following implantation of other organs.

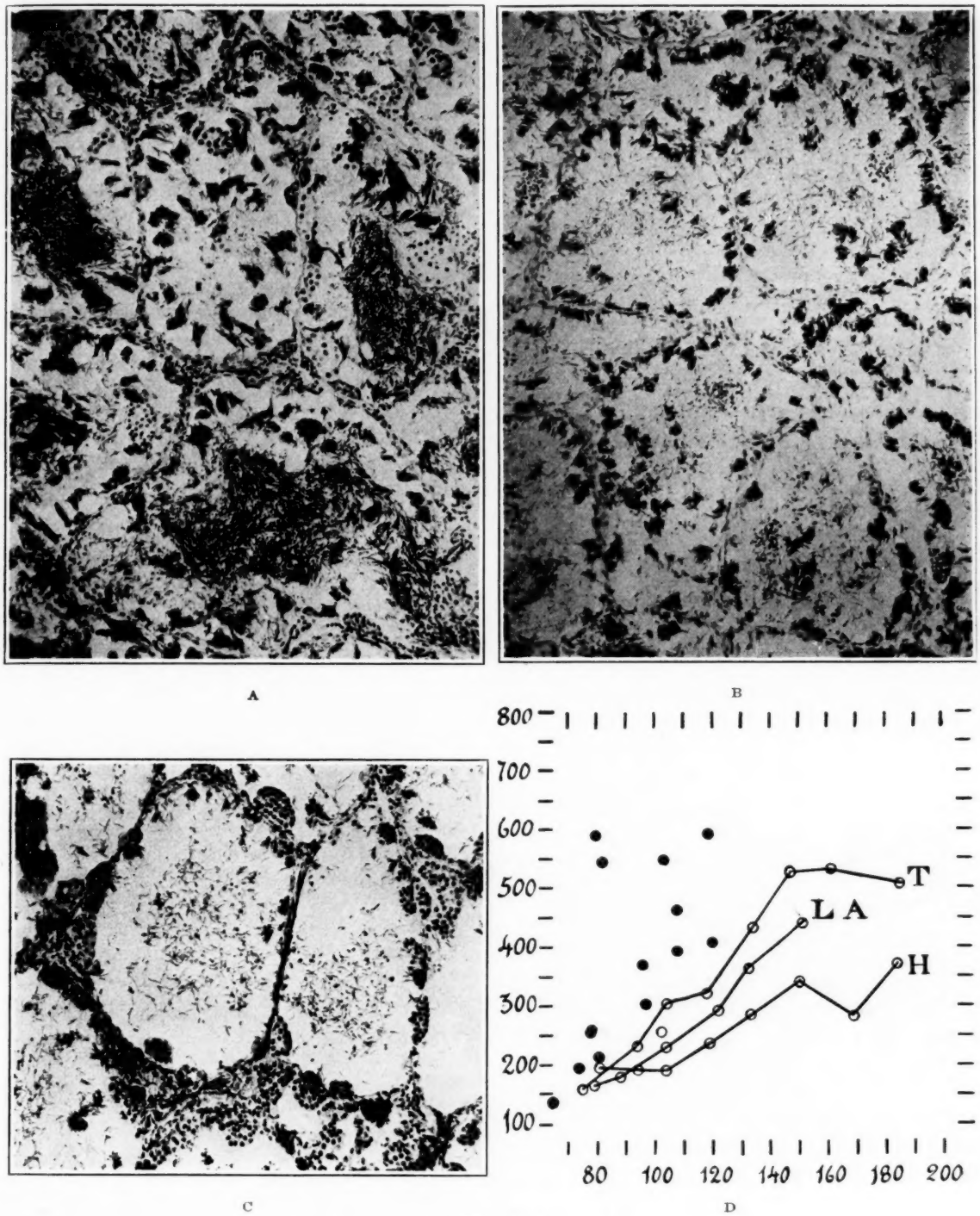


FIG. 12.

A. Microphotograph of a section through the testicle of a normal toad.

B. Microphotograph of a section through the testicle of a hypophysectomized toad.

C. Microphotograph of a section through the testicle of a toad which had received implantation of the principal lobe of the hypophysis.

D. Graphic representation of the weight, in mgm., of the testicles (ordinates) compared with the body weight, in Gm., of toads (abscissae) under different experimental conditions.

T. Normal.
L A. Without principal lobe.
H. Hypophysectomized.
Solid dots. Implanted with principal lobe.

Hyperactivity of the neuro-intermediate lobe.

This occurs with administration of the neuro-intermediate lobe of the toad or of the posterior mammalian lobe.

(a) There is *darkening of the skin*[4, 14, 15, 16, 20, 25, 35, 36, 37, 51, 52, 53, 54, 85] due to expansion of the melanophores; the principal lobe and the anterior mammalian lobe have a similar action which lasts a long time but is less intense.

(b) *Oliguria* with or without increase of weight.[50, 72] With small doses varying degrees of oliguria are produced, but with large doses there is complete anuria which lasts five to six hours. Increase in weight occurs in the latter cases and may be considerable (fig. 10), with interstitial, peritoneal and subcutaneous edema.[5, 35, 36, 37, 67, 72]

(c) The *rise in blood pressure* is marked in hypophysectomized animals with initial low blood pressure, but less so in normal animals. The neuro-intermediate (or mammalian posterior lobe) is more active than the principal lobe. The blood of the normal toad when injected into hypophysectomized toads causes a higher rise in blood pressure than the blood of hypophysectomized toads similarly injected (Neubach, unpublished).

(d) *Contraction of the Capillaries*[11] of the skin may be produced by a large dose, if the vessels were previously dilated.

Hyperactivity of the principal lobe.

This can be produced by implantation of the glandular lobe, which is the only one that has morphogenetic effects and effects on other endocrine glands. The metabolic and a few other general symptoms can also be obtained to a certain extent, but in a less marked degree, by implantation of the neuro-intermediate lobe.

1. *Morphogenesis and regulation of endocrine glands.*

(e) *Acceleration of growth* has been observed in the larval form of other Anura by Allen, Smith, etc.; we have not studied it in *Bufo arenarum.*

(f) *Hyperplasia and hyperactivity of the thyroid*[58, 59] are revealed by the state of the epithelium. (Fig. 11.) The cells become high columnar in type and there is vacuolization and reabsorption of the colloid.

(g) *Stimulation of the adrenals* has been seen by Smith in tadpoles, but has not been confirmed in this toad.

2. *Sexual and reproductive functions.*

(h) *Hypertrophy of the testes*[25, 35, 36, 40, 41] occurs in normal and hypophysectomized animals. The testes increase in weight, the seminal canals are dilated by fluid containing free spermatozoa, there is hypertrophy of the seminiferous epithelium and of the interstitial tissue. (Fig. 12.) The sexual embrace reflex appears out of season, even when the tuber is destroyed, and in immature animals precocious puberty takes place.

(i) *Hypertrophy of Bidder's organ*[41, 43] occurs in normal and hypophysectomized animals, particularly in castrates. It can be definitely stated that Bidder's organ cannot be transformed into ovarian tissue unless the pituitary is present. (See II, i, Atrophy of Bidder's organ.)

(j) *Ovulation and expulsion of the ova*[32, 35, 36, 37, 40, 65, 66] occur in one to three days. Observations were made by us (loc. cit.) independently of those of Wolf. This phenomenon also takes place in the absence of various organs* and of the larger part of the brain. (See Infundibulohypophyseal symptoms.)

3. *Metabolic functions.*

The metabolic functions are only slightly affected in normal animals but much more so in the hypophysectomized.

(k) The *respiratory metabolism* does not change.

(l) There is *rise in blood sugar* and *hepatic glycogen,* also in *muscular*[27, 34, 48] and *cardiac*[10, 70] glycogen.

(m) The *hyperglycemia produced* by *morphin* and *adrenalin* is more pronounced.[33]

(n) There is a marked *increase in pancreatic diabetes*[5, 7, 28, 29, 30, 32, 45] particularly in the hypophysectomized toads and in those with infundibulotuberal lesions. In this reaction the liver plays an indispensable rôle (Campos and collaborators), but certain other viscera, namely the forebrain, the midbrain, the intermediate brain and the adrenals do not. In toads with intact pancreas no diabetogenic activity can be obtained, even when forty lobes are implanted.[31]

(o) *Phlorhizin glycosuria* is increased.[11]

(p) The *hypoglycemic* and the *toxic effects of insulin* are reduced both in normal and hypophysectomized animals.[49, 50]

(q) Increased *elimination of nitrogen* occurs in the hypophysectomized toads.[27]

4. *General symptoms* (probably metabolic).

These can only be produced to a slight degree in normal animals, but they are very marked in the hypophysectomized.

(r) *Operations are well tolerated*[2, 25, 26, 59, 72] by the hypophysectomized toads.

(s) *Asthenia* which follows hypophysectomy is prevented or cured.[2, 9, 24, 35, 76] The animals recover or, if treated early, maintain their agility and do not die. Sometimes it is possible to effect a cure even after convulsions have set in.

*The gonadotropic action of the principal lobe is not modified either in thyroidectomized or castrated animals.[65, 66] There is also a gonadotropic action in fishes and reptiles.[23]

(t) The *formation of a horny cuticle*[76] by the hypophysectomized toads is prevented, or, if already formed, this cuticle is shed. Thus the principal lobe of the pituitary may be said to regulate the shedding of the skin.

(u) *Cutaneous secretion,* which is scarce in the hypophysectomized toads, is restored to normality or its diminution may be prevented.[2]

(v) It is possible to prevent or correct the bradycardia, the fall in cardiac glycogen, the decrease in cardiac chronaxie[70] as well as the ineffectiveness of the vagus which follows hypophysectomy.

INFUNDIBULOTUBERAL (DIENCEPHALIC) SYMPTOMS

There is only one symptom* referable to lesions which are limited to the diencephalon. This is the sexual embrace[36, 37] which occurs in a large number of male toads when the infundibulotuberal region is cauterized.

INFUNDIBULOHYPOPHYSEAL (DIENCEPHALO-HYPOPHYSEAL) SYMPTOMS

If the *Lobus infundibularis*† is injured secondary alterations occur in the pituitary. First, the circulation on its ventral surface stops and later a central infarct develops in the principal lobe. (Figs. 13 and 14.) This reaches its maximum in seven days, lasts some eleven to seventeen days and finally the lobe regenerates in twenty-five to thirty-five days, the chromophobe cells appearing earlier than the chromophile cells.[27, 28, 35, 57]

As a result there is an early stage of increased reabsorption of glandular products followed by a later stage of prolonged inhibition of the pituitary functions.‡

The initial increase in reabsorption is characterized by:

(a) *Transient darkening of the skin*[16, 38, 48, 49, 86] lasting one to three days, which does not occur if the neuro-intermediate lobe is absent.

*Originally we thought ovulation, polyuria and the formation of a thick horny layer were diencephalic symptoms (see infundibulohypophyseal symptoms).

†Anatomy and vascularization described by Houssay, Biasotti and Sammartino.[32]

‡The same is observed in the dog (Houssay, Davis, etc.).

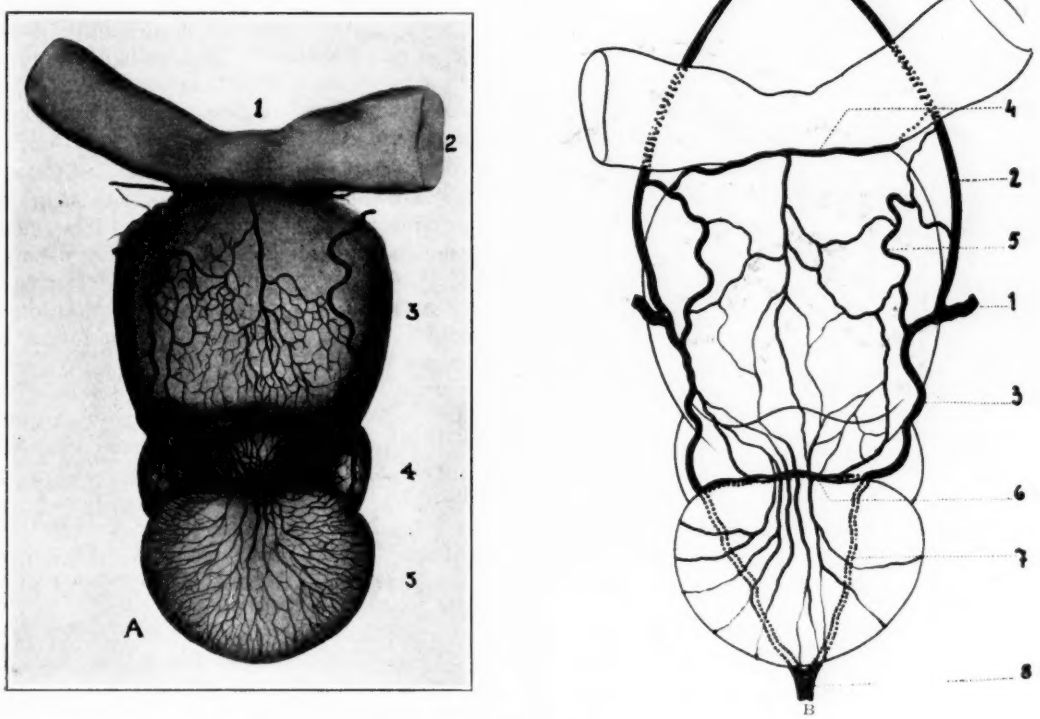


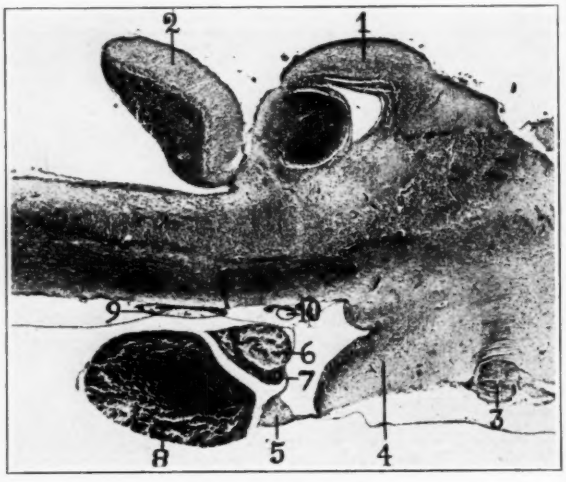
FIG. 13.

Drawing and diagram of the vascular supply of the hypophysis of the toad.

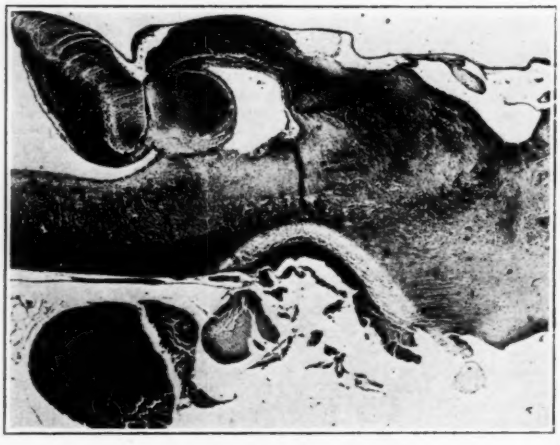
A.—(1) Pars basalis of the Pars terminalis.
(2) Chiasm n. optici (optic chiasm).
(3) Lobus infundibularis.
(4) Neuro-intermedial lobes of the Hypophysis.
(5) Principal lobe of the Hypophysis.

B.—(1) Cerebral carotid.
(2) Anterior branch.
(3) Posterior branch.
(4) Retrochiasmatic branch.
(5) Infundibular branches.
(6) Retroinfundibular communicating branch (anastomosis).
(7) Communicating branch to the vertebral artery.
(8) Vertebral artery.

(b) *Ovulation and expulsion of the ova*,[14, 15, 16] which is observed in 20 to 80 per cent of the females, but not if the principal lobe is absent.[36, 37]



A



B

FIG. 14.

Median section of the brain of *Bufo arenarum* (Hensell) (Magnification × 15).

A.—Normal.

(1) Optic lobes.
(2) Cerebellum.
(3) Optic chiasm.
(4) Infundibular lobes.
(5) Their posterior extension.
(6) Pars nervosa of Hypophysis.
(7) Pars intermedia.
(8) Pars glandularis (principal or chromophile lobe).
(9) Branch of the posterior cerebral artery that joins the basilar.
(10) Transverse retroinfundibular artery.

B.—Following cauterization of the infundibular lobes and tuber cinereum.
The lobus infundibularis, the base of the mesencephalon and the anterior part of the crura cerebri are involved.

(c) *Polyuria*[35, 36, 37, 38, 72] which is transient and inconstant and is due to neuro-intermediate insufficiency.

The functional inhibition of the principal lobe is characterized by:

(d) *Thickening and adherence of the horny layer of the skin*[1, 2, 14, 15, 16, 28, 32, 35, 37, 76] which is observed in 15 to 60 per cent of the cases and which may be corrected by administration of principal lobe extract.

(e) *Inhibition of pancreatic or phlorhizin diabetes*,[27, 28, 32] which is usually slightly less intense than in the hypophysectomized animals. When implanted these pituitaries have the usual diabetogenic activity, and their gonadotropic effect is only slightly diminished, but *in situ* they do not function normally.

Apart from these outstanding symptoms others which are less marked can be observed. Among these may be mentioned asthenia, which is rare, occurring only in 10 to 15 per cent of the cases;[24] a slight flattening of the thyroid epithelium;[58, 59] a slight but inconstant fall in blood sugar;[48, 49] and a slightly irregular arterial blood pressure which may be above or below normal.[17, 39, 69] The heart,[70] the testes,[41] the hemoglobin content of the blood,[71] and the liver glycogen[48, 49] are normal.

PITUITARY HORMONES

Although the actual hormones have not been isolated, nevertheless on the basis of an analysis of the symptoms of insufficiency and hyperactivity and the effects of restitution, it can be considered probable that hormones, with actions as listed below, exist.

The neuro-intermediate lobe possesses in larger proportion than does the principal lobe: melanophore dilator, arteriole and capillary constrictor,[50, 72] oliguric, water metabolic[50, 72] and oxytocic* actions; and in lesser degree than does the principal lobe a regulatory action on carbohydrate metabolism.[5, 7, 28, 29, 30, 32, 45†]

The principal lobe alone[2, 76] possesses gonadotropic,[2, 9, 24, 25, 35, 36, 40, 41, 43, 76] thyrotropic,[58, 59] growth stimulatory and cutaneous actions. In common with the other lobe, but to a much greater degree, it possesses a regulatory action on carbohydrate metabolism[5, 7, 28, 29, 30, 32, 45 †] and to a lesser degree it acts on the melanophores, the small vessels, the excretion of urine and the metabolism of water.

SUMMARY

In the toad the pituitary is a most important organ, as it controls functions which are necessary for the maintenance of the life of the in-

*Houssay, Giusti and Lascano-Gonzalez[40, 41] found the activity of the principal lobe to be, on an average, 0.001 international units per mg. and 0.042 units per lobe; that of the neuro-intermediate 0.41 units per mg. and 0.95 units per lobe, which is the same as that found in bovine posterior pituitary lobe (Houssay, Giusti and Lahille[39]).

†Orias[68] has observed the same phenomenon in the fish, *Mustelus canis*, and Houssay and Biasotti[30] in other amphibia and reptiles.

dividual and also controls sexual and reproductive activities which are necessary for the maintenance of the species. It is the central organ in the endocrine constellation, as it is necessary for the development and maintenance of the anatomical and functional integrity of the other internal secretory glands.

The neuro-intermediate lobe governs various functions:

(1) It maintains the normal color of the skin (with its physiological and pharmacological changes) by preserving an adequate melanophore expansion. The secretion of this hormone is regulated reflexly, and is therefore under the control of the central nervous system.

(2) It preserves the tone of arterioles and capillaries, thus having an important influence in the maintenance of the arterial blood pressure.

(3) It regulates the water metabolism; first, by its action on the kidneys and, secondly, on the skin and other tissues.

The principal lobe governs the following functions:

(1) The development and maintenance of the thyroid and the gonads (including Bidder's organ). It also provides for their compensatory hypertrophy. An adrenotropic action has not been demonstrated in the adult toad.

(2) The occurrence of normal ovulation is due to a pituitary hypersecretion in the female which is reflexly stimulated by the sexual embrace.

(3) The development of the thyroid which permits the metamorphosis of the larva into the adult form.

(4) The regulation of the casting of the skin (with the formation and desquamation of the horny layer) and also the regulation of the cutaneous glandular secretions.

(5) The metabolic functions (carbohydrate metabolism, endogenous protein metabolism, etc.). These are so important, that the loss of pituitary control leads to a state of progressive asthenia, causing death in three to eight weeks. The central nervous system is affected and later the heart, muscles, etc.

Injury of the tuber cinereum produces secondary lesions in the pituitary with an initial glandular reabsorption and later a more or less marked state of pituitary insufficiency.

It is evident that many of these functions of the pituitary either cannot be seen in mammals or will have less importance than in the toad. I have found many functions in the latter which only later were seen in the mammal. For this reason I have studied each function primarily in the toad and simultaneously or subsequently in the more complex animals, and so have been able to understand its significance more readily. No student of the hypophysis can ignore the valuable results obtained by studying its functions in the toad, and all will feel grateful to this low species for the many secrets it has revealed on such an important organ.

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A STUDY OF THE USE OF CORAMINE IN DEALING WITH THE EFFECTS OF BARBITURIC ACID DERIVATIVES*

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THE drugs of the barbituric acid series, since their introduction to the medical profession, have been widely used in order to induce states of unconsciousness ranging from simple sleep from which it is easy to rouse an individual to what amounts to a barbituric acid coma from which no amount of urging, chemical or physical, will produce consciousness until the effect of the drug has worn off. It is only to be expected that with such wide use of these drugs, by both skilled and unskilled persons, a certain number of bad reactions will occur. But, unfortunately, some of these bad reactions become worse, and individuals die.

Furthermore, since it has been possible to buy these drugs for a small sum at any drug counter, the layman, becoming depressed or otherwise wishing to die, has by their use increased the number of near-deaths and deaths quite considerably. And there are sufficient reports in the existing literature relative to these fatalities to quiet any skeptic—to make him wish to have at hand a ready and safe counteracting drug should it fall to his lot to have to treat such a case of poisoning.

It is the belief of the writer that coramine is such a counteractant, such belief being the outcome of the work presented in this paper and the work which has been conducted for so many years by European workers and recently by a very few Americans, on the effect of coramine on hypnotics, narcotics and anesthetics.

One of the first pieces of work in this respect pointed to its possible value, for in 1892 Köppen[1] while studying the then relatively new drug, coramyrtin, reported that it was of value in the counteraction of narcosis. In 1924 Uhlmann[2] confirmed these findings, stating that coramine stimulated the centers of the medulla, respiration especially being affected, i.e., increased. In addition he found that this drug produced a rise in the blood pressure and increased the cardiac excursions. In 1925 Guth[3] demonstrated increased blood flow due to coramine in patients under the influence of general anesthesia. In 1926 Asher[4] at this time stated that coramine improved not only the circulation of animals under depressant drugs but also the

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respiration, concluding that it was of definite value in this respect. In 1928 Bürgi and Gordonoff[5] found that coramine rendered the heart more resistant to the action of depressant drugs. In 1928 Schübel and Gehlen,[6] in 1929 Helaers,[7] in 1931 Killian,[8] Mörl,[9] and Domanig,[10] in 1932 Kennedy,[11] Fischmann,[12] Glaeser,[13] and Altmann,[14] in 1933 Killian,[15] Buzzo and Bertani,[16] Reese,[17] and Wood,[18] in 1934 Ervenich,[19] Takabe,[20] Schwoerer,[21] in 1935 Gyllensvärd[22] and Buzzo and Bertani,[23] and in 1936 Levi and Krinsky[24] and Eversole,[25] to mention a few, all confirmed the value of coramine in relieving depressed respiration or unconscious states due to hypnotics, narcotics or anesthetics.

And so the reports on the value of this drug as a tool in the counteraction of the effects produced by narcotics, hypnotics and anesthetics have gradually accumulated, all pointing with more or less accuracy to the positive value of coramine in cases where the respiration is depressed and unconsciousness is present, and where it is advantageous to terminate the action of the depressant drug with as little delay as possible. It is the purpose of this paper to present a planned study on the actual value of coramine in the counteraction of the unconscious states produced in human beings by the administration of certain barbituric acid derivatives.

METHOD

All of the individuals in this study were males. Their ages ranged from sixteen to fifty-five years. All were mentally ill, the type of illness ranging throughout the psychotic scale. It was not felt that these individuals would produce results other than what might be expected of individuals with apparently normal personality reactions. Physically they were normal.

Each person was given the specified drug and then placed in bed. When he was asleep, attempts were made to rouse him by moderate shaking. If this was unsuccessful pinpricking was resorted to. Only those individuals were used who were sufficiently under the influence of the prescribed barbiturate not to rouse from their sleep as a result of the above stimulation.

As soon as the person was definitely asleep his blood pressure, pulse, respiration and clinical state were noted and then 5 cc. of coramine was administered intravenously. The patient was watched in this manner for ten minutes and if consciousness had not been restored at the end of that time, 5 cc. of coramine was administered every ten minutes until he did rouse. The coramine was given intravenously in every instance.

The effect of the coramine on patients having received a barbituric acid derivative was examined a total of 84 times. The controls received the barbiturate but no coramine. There was one control for each type of barbiturate used.

RESULTS

The Efficacy of Coramine in Relieving the Symptoms Produced by the Barbituric Acid Derivatives.

A. Sodium amytal:
   1. Twenty-four individuals each received 12 grains of sodium amytal by mouth. Of these, eighteen were relieved of their symptoms by 5 cc. of coramine, four by 10 cc. and two by 15 cc.
   2. Twelve individuals each received 7½ grains of sodium amytal intravenously. Of these, eight were relieved of their symptoms by 5 cc. of coramine and four by 10 cc.

B. Luminal:
   3. Twelve individuals each received 6 grains of luminal by mouth. Each was relieved of his symptoms by 5 cc. of coramine.
   4. Twelve individuals each received 6 grains of sodium luminal intravenously. Each was relieved of his symptoms by 5 cc. of coramine.

C. Sodium Ortal:
   5. Ten individuals received 9 grains of sodium ortal by mouth. Each was relieved of his symptoms by 5 cc. of coramine.

D. Nembutal:
   6. Five individuals received 3 grains of nembutal by mouth. Each was relieved of his symptoms by 5 cc. of coramine.
   7. Six individuals received 7½ grains of nembutal intravenously. Each was relieved of his symptoms by 10 cc. of coramine.
   8. Three individuals received 15 grains of nembutal per rectum. Two were relieved of their symptoms by 15 cc. of coramine and one by 20 cc.

The Effects of the Coramine as Observed During the Study.

In each individual who had received a barbituric acid derivative the primary and important factor relieved was the state of unconsciousness. In each instance this state was abolished, some persons having to receive more coramine than others in order to achieve this result. The pulse rate and volume in no individual was altered appreciably by the coramine. Likewise, the blood pressure was not altered appreciably, regardless of whether arteriosclerosis was present or absent, and irrespective of the presence of normal, low or high blood pressure. In each person the respira-

tions were increased, not only in rate but also in depth. The rate was increased from two to ten per minute. The depth was increased from just slight increases to increases which, in two cases not a part of this paper but who had taken almost 100 grains of luminal and who had received 80 and 85 cc. of coramine, were profound and noisy and could be distinctly heard and counted at least thirty feet away. The skin over the face was occasionally flushed. No sweating was observed. In twenty-one cases the administration of coramine in 5 and 10 cc. doses was definitely followed by hiccoughs which lasted from five to fifteen minutes. In five cases after 10 cc. of coramine there was vomiting which was projectile, lasting a few minutes and then subsiding. In no individual was there any alteration in the emotional or intellectual state as evidenced either by questioning or by observation of physical activity.

The After-Effects of Coramine.

Other than the relief of the symptoms produced by the administration of barbituric acid derivatives, no after-effects of any type were noted.

Controls.

For each barbituric acid derivative one control individual was used. He was given the same dosage of the barbiturate as the individuals receiving, in addition, the coramine. In every instance the control individuals remained unconscious for hours longer than the persons receiving coramine, who were unconscious a matter of minutes.

DISCUSSION

With the barbituric acid derivatives having such widespread use by the medical profession and such careless and deliberately destructive use by the laymen, it is imperative that there be available some drug which is able to counteract the effects of these derivatives, some drug which is safe and in which the safety is wide of margin. Furthermore, inasmuch as there is occasionally a bad reaction from a very small dose of these barbiturates it is even more imperative that a counteracting drug should be available which is rapid in action. The results of this study and of the studies which have preceded it would tend to establish coramine as safe, and as a drug relatively certain to counteract rapidly the symptoms of drugs of the barbituric acid series. The fact that in this study there were encountered no failures is quite important, for it is this type of result which is desired in the use of an "antidote" for any drug whose reaction may become undesirable.

This study, of course, cannot claim results of value in instances other than those described, but from the results reported it would most certainly be inferred that coramine would be of value in counteracting the effects of a wide range of barbiturates with a wide range of dosages. Further studies, it is hoped, will clarify this point and give greater insight into the ability of coramine to neutralize larger doses of the barbiturates in man. Moreover, from this study, it is impossible to predict the length of time which may lapse between the administration of the barbiturate and the administration of the coramine, and the latter still work effectively. It can only be said that from experience in this respect with the two cases referred to, it was learned that with exceptionally large doses of luminal, i.e., about 100 grains, a lapse of sixteen hours between the taking of the barbiturate and the administration of the coramine was too long an interval for resuscitation to take place.

The dosage of coramine could not be standardized in this study, because it appeared that there was a definite individual ability or disability of persons to exhibit the barbiturate effects, some persons being profoundly unconscious while others receiving the same dosage would be only lightly so. This, of course, affected the amount of coramine necessary to counteract the barbiturate. These same observations hold true for the type of barbiturate used. Evidently, the ability of the coramine to counteract the effects produced by the barbiturates in man depend not only upon the chemical-physical antagonism existing between the two drugs, from a medical point of view, but also upon the ability of the coramine to combat the affinity of the individual's body for the barbiturate.

The unexpected reactions obtained during the use of the coramine such as hiccoughs, vomiting and flushed skin were not felt to be alarming and could not be construed as disadvantageous to the use of the drug.

It was rather surprising, too, that some of the expected reactions to coramine did not occur, i.e., increase in pulse rate and volume, and increase in blood pressure. All of the results obtained in this respect were considered to be within normal physiological limits.

The site wherein the annulment of the barbiturate action by the coramine occurs is not known, but the bulk of the evidence existing in literature would indicate it as the central nervous system, probably the medulla and diencephalon. The mechanism of this annulment is even more obscure than the site, the mechanisms which have been described being entirely too technical for the purpose of this paper.

But, whether the site is definitely located, or the mechanisms understood, the fact remains that coramine is an interesting drug, and possesses definite possibilities in the counteraction of the effects produced by the barbituric acid derivatives. These possibilities certainly warrant further investigation, for a rapidly act-

ing drug possessing a wide margin of safety and reasonably certain in its ability to counteract the effects of the barbituric acid derivatives is an absolute necessity in any community where barbiturates are used.

SUMMARY

1. A study of the effect of coramine on individuals under the influence of barbituric acid derivatives is presented.

2. The physiological reactions of these individuals to coramine are described.

3. It is concluded that for the purposes of the experimental procedure herein described, coramine proved to be an excellent drug to counteract the effects produced by the barbiturates.

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FREQUENCY OF ACTIVE TUBERCULOSIS IN A HOSPITAL FOR MENTAL DISEASES*

With Special Reference to Schizophrenia

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IN modern psychiatric teaching there has been general acceptance of the view that psychic and somatic phenomena are closely interrelated aspects of the human organism. This conception lends new significance to studies of the incidence of different somatic diseases in patients suffering from mental disorders. Tuberculosis offers itself as a favorable object of such a study because of its wide distribution and the ample data available concerning its frequency in the general population.

It is commonly stated that tuberculous disease is much more prevalent in mental hospitals than in the country as a whole. Furthermore, there is a widespread belief that patients with schizophrenia are especially prone to develop active tuberculosis. If these observations are correct, the question at once arises whether the differences are merely incidental or whether they are part and parcel of some general disturbance which affects somatic as well as psychic spheres of activity. The latter standpoint has been advocated by Freeman[1] and by White[2]. Freeman[1] believed that there was a constitutional predisposition to tuberculous disease in schizophrenic individuals. White[2] explained its frequent occurrence in dementia praecox on the basis of a correlation between psychologic and somatic reactions. He pointed out that the schizoid psychoses are noncompensatory or decompensating in type in the sense that the patient with dementia praecox on the whole shows little active tendency to get well or to develop a compensatory type of psychologic reaction. In other words, the patient succumbs to the stresses that bring about his psychosis and deteriorates. In harmony with this reaction at the psychologic level one finds at the somatic level a similar type of reaction to the tuberculous infection. Such persons not only are easily infected, relatively speaking, but easily die of tuberculosis. Thus according to White[2], a person who presents the capacity for compensatory reactions will be found to present this capacity not only in his somatic reactions but

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also in his psychologic reactions. To some European authors[3, 4] the association of tuberculosis and schizophrenia has been striking enough to suggest that certain types of dementia praecox may be caused by the toxic effect of tuberculous infection on the central nervous system. On the other hand, Bogen, Tietz and Grace[5] have recently denied that the incidence of clinical tuberculosis was appreciably affected by the type of psychosis.

It is evident even from this brief discussion that there is no general agreement concerning the significance of the observations dealing with tuberculosis and its frequency of occurrence in mental disorders. We therefore thought it worth while to reëxamine the whole subject in the light of our own observations at a hospital for mental diseases.

RESULTS

A survey was made of the deaths from tuberculosis occurring in the Foxborough State Hospital from 1920 to 1934 inclusive. Owing to the small number of cases in many of the psychoses dealt with, separate figures were determined only in schizophrenia, which formed the largest group. The data are presented in table 1. A total of 1016 deaths from all causes occurred during this period. Tuberculosis accounted for 102 of the fatal cases, or 10 per cent of the total. This included 60 male and 42 female patients. All but 6 members of the group were diagnosed as cases of active pulmonary tuberculosis. Two patients presented tuberculosis of the kidneys and 4 acute miliary tuberculosis.

The average death rate from tuberculosis during the whole period under review was 6.5 per thousand patients. The average rate was 9.93 per thousand for the years 1920 to 1924, 6.53 per thousand for the years 1925 to 1929 and 4.79 per thousand for the years 1930 to 1934 inclusive.

Sixty-five patients who showed active infection, or 63.7 per cent of the whole tuberculous group, were diagnosed as cases of schizophrenia. The average duration of the somatic disease was approximately six months in both the schizophrenic and the nonschizophrenic cases. The average length of time spent in the hospital before symptoms of tuberculosis were detected was 4.8 years in the former group and 5.6 years in the latter. Clinical evidence of the disease was observed on admission in 22 of the patients, 8 of whom were suffering from dementia praecox.

Since the diagnosis was in many instances based solely on clinical observations, an attempt was made to verify the accuracy of the figures by comparing them with those obtained from the postmortem examinations made during the same period. Necropsies were performed in 373 cases, of which 45, or 12.1 per cent, showed ac-

TABLE 1

DEATHS FROM ALL CAUSES AND FROM TUBERCULOSIS AT THE FOXBOROUGH STATE HOSPITAL

Year	Number of Patients	Deaths from All Causes		Deaths from Tuberculosis			Deaths in Schizophrenia				Deaths in All Other Psychoses			
							From All Causes		From Tuberculosis		From All Causes		From Tuberculosis	
		Number of Deaths	Deaths per Thousand	Number of Deaths	Deaths per Thousand	Percentage of Total Mortality	Number of Deaths	Percentage of Total Mortality	Number of Deaths	Percentage of Schizophrenic Deaths	Number of Deaths	Percentage of Total Mortality	Number of Deaths	Percentage of Non-schizophrenic Deaths
1920	604	37	61.1	9	14.9	24.32	11	29.73	4	36.36	26	70.27	5	19.23
1921	661	37	56.0	5	7.6	13.51	11	29.73	4	36.36	26	70.27	1	3.85
1922	681	43	63.1	11	16.1	25.58	13	30.23	6	46.15	30	69.77	5	16.67
1923	704	57	81.0	8	11.4	14.03	13	22.81	7	53.85	44	77.19	1	2.27
1924	875	36	41.1	2	2.3	5.55	6	16.67	1	16.67	30	83.33	1	3.33
1925	979	68	69.4	4	4.1	5.88	11	16.18	2	18.18	57	83.82	2	3.51
1926	976	80	82.0	9	9.2	11.25	15	18.75	8	53.33	65	81.25	1	1.54
1927	1080	79	73.1	10	9.2	12.66	13	16.46	8	61.54	66	83.54	2	3.03
1928	1147	65	56.7	5	4.3	7.69	12	18.46	1	8.33	53	81.54	4	7.55
1929	1173	65	55.4	7	6.0	10.77	18	27.69	6	33.33	47	72.31	1	2.13
1930	1200	71	59.2	5	4.2	7.04	7	9.86	3	42.86	64	90.14	2	3.12
1931	1310	75	57.2	7	5.3	9.33	14	18.67	6	42.86	61	81.33	1	1.64
1932	1304	79	60.6	5	3.8	6.33	16	20.25	3	18.75	63	79.75	2	3.17
1933	1385	106	76.5	5	3.6	4.72	14	13.21	1	7.14	92	86.79	4	4.35
1934	1481	118	79.7	10	6.7	8.47	19	16.10	5	26.31	99	83.90	5	5.05
Totals and Averages	15560	1016	65.3	102	6.5	10.04	193	18.99	65	33.67	823	81.01	37	4.50

tive tuberculosis. This figure is only slightly higher than that obtained for the whole group and in view of the smaller number of cases it is doubtful whether the difference is of any significance.

DISCUSSION

Our figures do not differ radically from those recorded in the recent literature and therefore probably provide a representative sample in spite of the small size of the group. McGhie and Brink[6] found that the percentage of deaths due to tuberculosis in Ontario hospitals ranged from 5.95 to 10.66 per cent in the years 1928 to 1932. During the same period our figures fluctuated between 4.71 and 10.93 per cent. Wechsler[7] in Switzerland stated that 6.01 per cent of the deaths occurring in a mental hospital from 1921 to 1931 were caused by tuberculosis. According to Malzberg[8], this disease was responsible for 9.5 per cent of the deaths taking place in New York State Hospitals during the years 1929 to 1931 inclusive. Data obtained by Warren and Canavan[9] in 802 autopsies in Massachusetts State Hospitals for Mental Diseases showed that tuberculosis accounted for 11.7 per cent of the fatalities. Freeman[1] reported that a diagnosis of active tuberculosis was made in over 17 per cent of 5600 cases in which postmortem examinations were performed. His higher results may perhaps be accounted for by the larger proportion of colored patients in his group, for he found that the tuberculosis mortality rate of the colored population was two to four times that of the white population.

The observations presented here confirm the generally accepted view that tuberculous disease is commoner among patients in mental hospitals than in the outside population. Since the vast majority of our patients were twenty years of age or over, comparisons have been made with adult groups. In table 2 the data are arranged for the three five-year periods included in the present study. The average mortality rates from tuberculosis for the years 1920 to 1924, 1925 to 1929 and 1930 to 1934 inclusive were respectively 9.93, 6.53 and 4.79 per thousand in the hospital group and 1.22, 0.996 and 0.749 per thousand in the adult population of Massachusetts.* Thus the death rate was 8.13 times greater among our mental patients than in the adult population of the state during the first five-year period, 6.56 times greater during the second period and 6.39 times greater during the final period. Higher figures were obtained by Malzberg[8] and Freeman[1]. Freeman[1] found that the mortality rate among mental patients was about ten times that of the population at large. Malzberg[8] stated that the patient death rate from tuberculosis in New York State Hospitals during the years 1929 to 1931 inclusive was 8.28 per thousand, exceeding that of the general population in the ratio of 11.7 to 1. In spite of this difference, the proportionate mortality from tuberculosis in our group was very similar to that reported by Malzberg[8].

It is interesting to note that the patient mortality rate from all causes was also increased, being from 3.94 to 4.39 times higher than the general mortality rate of the adult population of the state* during the periods under consideration (table 2). Malzberg[8] found that the death rate in mental hospitals was 7.4 times greater than that of the general population, but after making corrections for differences of age the ratio of the two rates was 4.7 to 1. Even with this general increase it can be seen from table 2 that the proportionate mortality from tuberculosis is consistently higher among our patients than in the adult population of the state.[10]

TABLE 2

MORTALITY RATES OF THE HOSPITAL POPULATION AND THE ADULT POPULATION OF MASSACHUSETTS FOR THE YEARS 1920 TO 1934

	Deaths from Tuberculosis, per Thousand		Deaths from All Causes, per Thousand		Proportionate Mortality from Tuberculosis, per cent	
	Foxborough State Hospital	Adult Population of Mass.*	Foxborough State Hospital	Adult Population of Mass.	Foxborough State Hospital	Adult Population of Mass.
1920-1924	9.93	1.222	59.5	15.1	16.67	8.05
1925-1929	6.53	0.996	66.6	15.4	9.80	6.46
1930-1934	4.79	0.749	67.2	15.3	7.13	4.89

*Data supplied by Dr. Alton S. Pope of the Division of Tuberculosis, Massachusetts Department of Public Health.

The majority of the deaths from tuberculosis occurred in patients with schizophrenia. It has been frequently pointed out that tuberculosis occupies first place in the list of causes of death in cases of dementia praecox. One-third of our patients with this psychosis who died during the period under review presented evidence of active tuberculosis. The corresponding figures

*The figures for the adult population, which included persons twenty years of age and over, were kindly supplied by Dr. Alton S. Pope of the Division of Tuberculosis, Massachusetts Department of Public Health.

of Freeman[1], Malzberg[8], Wechsler[7] and Löw[11] were 30.94 per cent, 28.4 per cent, 14.74 per cent and 50 per cent, respectively. In contrast to these high figures in dementia praecox, active tuberculosis was noted in only 4.5 per cent of the deaths occurring in all other types of psychosis.

At first sight these observations seem to suggest that the incidence of tuberculosis is much greater in the schizophrenic population than in patients with other psychoses. However, an analysis of our data does not wholly bear out such a conclusion. The schizophrenic group accounted for only 19 per cent of the total deaths though it constituted approximately half of the hospital population. According to Malzberg[8], the death rate of patients with dementia praecox is less than half that of all patients with mental disease. This is largely due to the fact that many toxic and organic factors that are seldom encountered in schizophrenic psychoses are common in other types of mental disorder. When the higher general mortality in the latter psychoses is taken into consideration it becomes evident that tuberculosis is actually more frequent in them than the percentage of deaths attributed to the infection would indicate.

The data necessary for an exact comparison are not available, but an approximate idea of the relative frequency of active tuberculosis in the two contrasted groups may be obtained from the following considerations. The figures for the resident population show that 51.6 per cent of the patients in the Foxborough State Hospital[12] on September 30, 1933, were classified as cases of dementia praecox. If the hospital population remained stationary with tuberculosis equally distributed among all types of psychosis, about half of the deaths would fall within the schizophrenic group, as compared with a figure of 63.7 per cent actually obtained. Of course, the hospital population is constantly changing, but these changes tend to favor higher mortality rates from tuberculosis in dementia praecox. We refer to the well-known circumstance that patients with schizophrenia remain on an average for a considerably longer time in the hospital than most of the other patients, and thus the period during which tuberculous disease may develop is longer in such cases. That this time factor is of importance is suggested by the fact that the average period spent in hospital before symptoms of tuberculosis were detected was approximately five years, a period which is longer than the average duration of residence observed in many of the nonschizophrenic psychoses. Here we might add that the recent observations of Bogen, Tietz and Grace[5] lend support to our standpoint, for they found that the incidence of clinical tuberculosis increased with the length of stay in the institution.

In view of the considerations discussed above it is our impression that there is no great difference between schizophrenia and the other types of psychosis with respect to the frequency of active tuberculosis in them. This conclusion is in accord with the observations of Malzberg[8], who found that the standardized death rate from pulmonary tuberculosis among patients with dementia praecox exceeded that among all patients only in the ratio of 1.1 to 1. At the same time, it should be remembered that patients with psychoses other than schizophrenia are subject as a group to a very high mortality from all causes, so that tuberculosis is in reality not more frequent, relatively speaking, than other somatic diseases. In schizophrenia, however, tuberculosis is the leading cause of death, and in this sense we may speak of an increased susceptibility to tuberculosis in dementia praecox as compared with other psychotic conditions.

McGhie and Brink[6] suggested that the increased frequency of tuberculosis in mental hospitals may be attributed to several factors, such as the presence of undetected active cases in wards which are often overcrowded, a generally under par physical condition of many mental patients and the difficulty experienced with some patients in obtaining an adequate intake of food. Bogen, Tietz, and Grace[5] believed that the infection developed not as a result of the mental disease, per se, or as its cause, but from the conditions of confinement and exposure to infection resulting therefrom. These factors are undoubtedly of importance, but it is probable that they are more important in the nonschizophrenic group, in which numerous physical factors may impair the general health of the patients. In the schizophrenic group predisposing factors of this type are much less common. We must, therefore, look for other explanations of the increased susceptibility of schizophrenic patients to tuberculous disease. The view that dementia praecox is actually caused by the toxic effects of tuberculosis is open to many objections and has not been accepted by the great majority of workers owing to the lack of reliable evidence as to its validity.

The question now arises whether White's[2] theory of a correlation between psychologic and somatic reactions can account for the increased frequency of tuberculous infection in patients with dementia praecox. In this connection we would like to point out that there are great variations in the severity of the decompensating psychologic reaction observed in schizophrenic psychoses. An attempt was therefore made to determine whether there was any relation between the degree of psychologic decompensation and the occurrence of tuberculous disease. A scrutiny of the sixty-five cases of dementia praecox in which active tuberculosis was noted showed that hardly any of the patients had made even a moderately successful adjustment

to the comparatively simple environment of a state hospital. The great majority displayed profound deterioration with little ability to retain or develop any interest in the outside world. Most of them had been idle, inactive, and apathetic for years; in some cases periods of restlessness were observed from time to time. Only eleven members of the group had been engaged in any type of work during the years immediately preceding the onset of the tuberculous disease and even though the work was very simple in nature, it was usually performed irregularly and inefficiently. In contrast to this, a survey of the whole male schizophrenic population showed that slightly more than 50 per cent of the patients were regularly employed in useful occupations. We may therefore say that tuberculosis tends to occur in patients who show the least active tendency to get well mentally and who thus represent the most outspoken examples of a decompensating psychosis within the schizophrenic group.

These observations at first seem to confirm the view expressed by White.[2] On further consideration, however, they may be interpreted in another way. One might argue that the patients who are unable to reach a level of mental activity approaching the normal show an increased tendency to develop tuberculosis merely because they are especially liable to present faulty and unhealthy habits and at the same time are closely confined for prolonged periods. Other authors refused to accept such a view but stress the importance of an underlying constitutional factor. Freeman[1] found that the mortality rate from tuberculosis in epileptics is only a fifth of the rate in schizoid individuals, in spite of the fact that the confirmed epileptic may resemble in many outward respects the patient with long-standing dementia praecox. One might also mention Luxenburger's[13] work which showed that tuberculous disease was commoner among siblings of schizophrenic patients than in the general population.

In our opinion these two interpretations are not mutually incompatible. It is probable that the increased susceptibility of schizophrenic patients to tuberculosis is due to a combination of the two factors, unhygienic modes of life with prolonged hospitalization on the one hand, and a lowered resistance which is correlated with decompensating mental reactions on the other.

Finally, we would like to point out that, regardless of the factors involved, the mortality rate from tuberculosis in the hospital population has dropped from 9.93 per thousand in the years 1920 to 1924 to 4.79 per thousand in the years 1930 to 1934, a decrease of slightly more than 50 per cent. In the adult population of the state the rate has shown a drop of 39.7 per cent during the corresponding periods (table 2). An analysis of the data in table 1 indicates that the decrease was more pronounced in the schizophrenic group than in the other psychoses, suggesting that the improvement in the former particularly cannot be entirely accounted for by improving conditions in the population at large. The decrease in the frequency of tuberculosis among our mental patients is probably to be attributed to the greater emphasis placed on outdoor activities, physical occupation, adequate housing, and early segregation of active cases in recent years. It is interesting to note that the first two measures really belong in the field of occupational therapy, which has proved to be of definite benefit from a mental angle in patients with schizophrenia. The mortality from tuberculosis remains high, but the fact that it has already diminished considerably suggests that more intensive efforts along the lines mentioned should lead to still further improvement in the future.

SUMMARY

A survey of the deaths from tuberculosis during the years 1920 to 1934 was made at a state hospital for mental diseases.

The average mortality rate from tuberculosis during the whole period was 6.5 per thousand. The average rates for the years 1920 to 1924, 1925 to 1929 and 1930 to 1934 inclusive were respectively 9.93, 6.53 and 4.79 per thousand. These figures were respectively 8.13, 6.56 and 6.39 times greater than the death rates from tuberculosis in the adult population of Massachusetts during the corresponding five-year periods.

Although 63.7 per cent of the deaths from tuberculosis occurred in patients with schizophrenia, an analysis of the data showed that the incidence of active infection in dementia praecox did not differ greatly from that in all other psychoses considered as a group. In the latter, tuberculosis is not more frequent, relatively speaking, than other somatic disease. In contrast to this, tuberculosis is the leading cause of death in cases of dementia praecox, accounting for one third of the fatalities in that group, and in this sense one may speak of an increased susceptibility to tuberculous disease in patients with schizophrenia. This increased susceptibility is probably based on unhealthy habits, prolonged hospitalization and a lowered resistance which is correlated with decompensating types of mental reaction.

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CONGENITAL DEFECT OF THE PECTORAL MUSCLES

BY RUFUS R. LITTLE, M.D.*

A REVIEW of the literature on congenital defects of the pectoral muscles immediately impresses the reader by the apparent rarity of this condition. As observed by Bennett[1] the American literature contains very few reports of congenital defects of pectoral muscles, by far the greater number of cases coming from foreign sources. In fact, only seventeen cases were found to be recorded in the literature of the United States during the past fifteen years. As the deformity caused by absence of the pectoral muscles is apparent even on casual physical examination, it is to be wondered that more cases have not been recorded, especially if one accepts the estimate of Bing (quoted by Christopher[2]) that congenital absence of the pectoralis major and pectoralis minor muscles together comprised 28 per cent of the total of cases of congenital absence of muscles in a series collected by him. Probably this figure is somewhat high, as pointed out by Jones[3]. After an extensive search of the literature, Morley in 1923 found that about 220 cases of congenital defects of the pectoral muscles had been recorded up to that time. There have been comparatively few additions to that number. In reporting eight cases, Morley[4] states that five of these were seen in five months, and suggests that the condition is more common than is believed.

Several varieties of defects have been noted. It is agreed by observers that the most common abnormality found is absence of the pars sternocostalis of the pectoralis major together with absence of the pectoralis minor. One case of complete absence of the right pectoralis major muscle is recorded by Severn[5], it being proved at autopsy that the right pectoralis minor and both left pectoral muscles were present and well developed. There appears to be no predominance of the occurrence of pectoral defects on the right or on the left side. Only one case has been reported where the condition was bilateral[3]. Obviously, clinical detection of absence of the pectoralis minor alone is impossible, and as no such case had been recorded from the dissecting room, Christopher[2] concluded that "absence of the pectoralis minor unaccompanied by defects of the pectoralis major probably does not occur". However, Williams[8] later reported the case of a man who was operated on for carcinoma of the breast, and at operation the pectoralis minor muscle could not be found even by the most careful dissection, the pectoralis major being normal. This is admittedly a rare finding.

Various theories have been advanced concerning the etiology of pectoral defects. The condition is definitely congenital, yet heredity is not of great influence. One instance is cited of the condition being found in three members of one family[3]—father and two sons, and in other cases some congenital defect has accompanied the abnormality of the pectoral muscles, yet no conclusions can be drawn from these isolated occurrences. In one instance the condition was attributed to congenital syphilis[6]. However, this case lacked confirmation even by serological tests, and little support can be given to this explanation of the defect. It has been suggested that the condition may result from pressure of the forearm or knee of the fetus in utero, causing atrophy of developing muscle plates[4]; or possibly theories relating to phylogenetic retrogression may be applied to congenital absence of these muscles. Probably the most acceptable view in regard to the origin of the condition is that of Lewis,[7] who attributes it to an embryological defect. He has shown that the anlage of the pectoral muscles is situated in the lower cervical region in the early embryo. As the embryo develops, the pre-muscle mass enlarges and moves downward, becoming attached first to the clavicle, then to ribs, sternum, and abdominal fascia, at the same time becoming differentiated into major and minor muscles. Lewis believes that the defect results from failure of attachment and subsequent atrophy of the pars sternocostalis of the pectoralis major and of the pectoralis minor, or to lack of complete differentiation between the two muscles. To lend weight to these theories is the fact that in practically all reported cases of congenital defects of the pectoral muscles the presence of the clavicular portion of the pectoralis major is acknowledged, with absence of the pars sternocostalis and of the pectoralis minor.

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All observers are in agreement concerning the extremely slight disability resulting from absence of the pectoral muscles. Repeatedly cited is the case of Burke[9] of a good left-handed baseball pitcher with this abnormality on the left side. Other reports all confirm this observation, the patients themselves usually being unaware of the condition. As the action of the pectoral muscles is closely associated with that of the deltoid, subclavius, and other muscles of the shoulder girdle, compensatory action of these muscles inhibits any disability that might result from defects in the former. The pectoralis major, "if acting alone, adducts and draws forward the arm, bringing it across the front of the chest, and at the same time rotates it inward".[10] This action appeared to be entirely unimpaired in the case to be described herein. The pectoralis major, the pectoralis minor, and the subclavius muscles belong to the group of auxiliary muscles of respiration and are very important agents in forced inspiration. That defects of the pectoral muscles limit forced inspiration is indicated by the findings in the case being reported in this paper, expansion on the affected side being less than that on the normal side.

The deformity caused by pectoral defects, as previously stated, is quite apparent. The affected side of the thorax is flattened and the ribs are plainly visible and palpable beneath the skin and subcutaneous tissue. It is said that deformities in the nipple and breast are often present, and complete absence of the breast and nipple has been reported.[11] There may be defects in the underlying ribs, the cartilaginous portions often being distorted or absent.

Following is the report of a case which illustrates many of the commonly recognized findings in congenital defects of pectoral muscles, and in addition, presents a factor that may be of some clinical significance as the patient grows older.

This case is reported from a sanatorium for tuberculosis of children, the age limits for admission being one month and seventeen years. During the nine years in which this sanatorium has been reserved exclusively for children, and with over 2000 admissions during this time, this is the only case of congenital absence of the pectoral muscles that has been recorded, thus giving a very rough estimate of the relative frequency of this condition, assuming that repeated physical examinations of the chest would have detected such an abnormality.

Case report: G. P., male, white, aged six years. The history as obtained from the mother of this patient, records a normal, noninstrumental birth. The mother states that deformity of the right chest has been noticed since the birth of the patient. The child has always been active and apparently in good health, although somewhat thin. In August 1934 one eye became inflamed and the patient was taken to a hospital for treatment. There diagnoses of phlyctenular conjunctivitis and childhood type

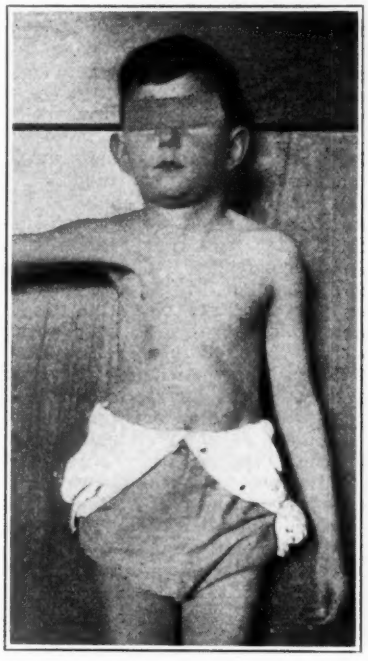

FIG. 1. Illustrates the absence of the pectoral fold.

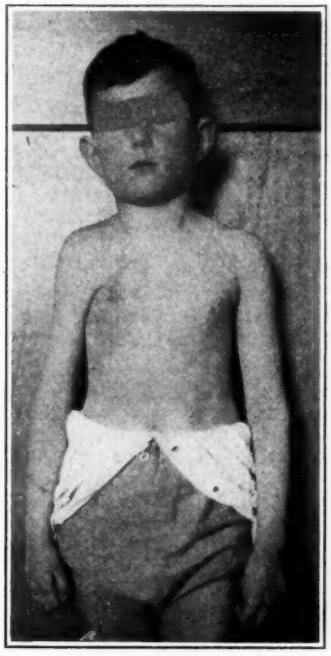

FIG. 2. Illustrates herniation of the lung upon increased intrathoracic pressure.

tuberculosis were made, and admission to a sanatorium was recommended. Upon admission the above diagnoses were confirmed. Roentgenogram of the lungs indicated childhood type tuberculosis, the pathology being in the hilar regions with no

demonstrable parenchymal involvement. Upon physical examination of the chest, deformity of the right side was immediately apparent. The right pectoral fold was absent, the underlying ribs being visible and palpable directly beneath the skin. The right side of the thorax was flat and poorly developed in contrast to the left side, which was of normal appearance. Measuring from midlines anteriorly and posteriorly, the circumference of the hemisphere formed by the right thorax was 4 cm. less than that of the left or normal side. Expansion of the right side on forced inspiration was 1 cm., while that on the normal side was 2 cm., giving a crude idea of the impairment of the action of these auxiliary muscles of respiration. On palpation, deformity of the third, fourth, and fifth ribs was detected, and confirmed by roentgenograms, their sternal ends being distorted and without cartilaginous attachment to the sternum, leaving between the ends of these ribs and the sternum, a comparatively large break in the continuity of the thoracic cage. Through this opening, herniation of the lung was visible upon cough or any effort that tended to increase the intrathoracic pressure. The presence of the clavicular portion of the pectoralis major was demonstrated by abducting and elevating the right arm, bringing this portion into relief. Absence of the pectoralis minor was demonstrated by resisted effort on the part of the patient to draw the arm and shoulder forward, downward, and inward, the skin becoming lax and a hollow forming where the pectoralis minor would be if present.

As in all previously reported cases of congenital absence of pectoral muscles, the function of the arm on the affected side was unimpaired, the patient being able to use this arm in any position fully as efficiently as the opposite arm. But as previously pointed out, some impairment in the function of these muscles as auxiliary muscles of respiration may be detected, although this is probably of little clinical significance.

The herniation described above, approximately the size of a lemon in this six year old boy, may eventually offer a surgical problem as he grows older and engages in strenuous physical activities, or in the event of the development of adult pulmonary tuberculosis with collapse therapy indicated.

Severn[5] observed that the absence of ill-effects resulting from defects of the pectoral muscles tends to show that a good functional result may be expected in patients whose pectoral muscles have been removed for malignancy. This observation likewise applies to diversion of the pectoral muscles in certain forms of surgical treatment of pulmonary tuberculosis.

Summary: A brief review of the American literature on congenital defects of the pectoral muscles is presented. Added to the list of previously reported cases is the report of a case with clinical manifestations that may be of potential significance.

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ACUTE, ULCERATIVE, TERMINAL ILEITIS AND COLITIS

A Case Report

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THIS patient was admitted to the hospital on August 22, 1935 and remained there from that day until September 12. During that time she ran a temperature varying from 102° to 103° every evening.

On admission she gave the following history: For the past month she has had pain across the lower abdomen soon after eating. Sometimes she has had to sit down and hold her hands to the abdomen because the pain was so severe. It usually passed away in a short time. Lately the pain has occurred more frequently and lasted longer, not altogether associated with eating. For the past few days she has been nauseated, and vomited bitter-tasting yellow fluid. Occasionally she has had headache. There has been no diarrhea. The bowels have been very constipated and the stools scanty, light yellow in color. She has taken no cathartics. There has been some epigastric pain at times. The evening of entrance she was so nauseated and had so much pain that a doctor was finally called. He referred the patient to the hospital.

She has had the usual childhood diseases such as measles, mumps, whooping cough and sore throats, but has not yet begun to menstruate. Until now, she had had no abdominal pain or digestive trouble.

Physical examination on admission: A well-developed, rather emaciated white female aged 14 years, complaining of abdominal pain. Head: Eyes are equal and regular, reacting to light and accommodation. There is no nystagmus; external ocular movements are negative. External examination of the nose and ears negative. Mouth: Teeth in fair condition. The tongue is moist and moderately coated, protruding in the midline without tremor. The tonsils are moderately enlarged but not markedly reddened. Neck: There is no cervical adenopathy; no stiffness. Chest: Lungs, expansion is symmetrical and there are no areas of abnormal dulness and no adventitious sounds. Breasts negative. The heart is not enlarged, rhythm regular, rate 90. B. P. 98 systolic, 58 diastolic. There are no thrills, rubs, or murmurs. The point of maximum impulse is in the 5th interspace within the midclavicular line. The abdomen is tender and rather doughy in consistency throughout, but more marked in both lower quadrants. No evidence of fluid. The extremities are negative except for rather marked hypertrichosis. Knee jerks, biceps, triceps, and reflexes are moderately hyperactive. No pathological reflexes and no sustained clonus. Rectal and pelvic examination not done.

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On August 24 there was more marked spasm and tenderness in the right lower quadrant than elsewhere in the abdomen.

The following were the laboratory findings:

Wassermann negative.

Widal negative.

Stool: No parasites seen (Amoeba or Tapeworm).

Agglutination test for undulant fever was negative.

Blood culture—no growth in forty-eight hours. No growth in eight days.

Stool: Guaiac test shows a very faint trace of blood. Occasional pus cell seen in wet sediment. Culture B. Coli.

On September 12 under gas, oxygen, and ether, a midline incision, extending from the umbilicus to the symphysis, was made. On opening the peritoneum, approximately 100 to 150 cubic centimeters of free, straw-colored fluid was found in the abdominal cavity. Beginning about 18 centimeters from the ileocecal valve, the small bowel was markedly distended with gas. The terminal portion of the ileum was thickened and had a doughy sensation on palpation. The mesentery was markedly edematous, and scattered throughout were a great many glands varying in size. Exploration of the appendix disclosed it to be normal in all respects. The proximal portion of the cecum for a distance of about 16 centimeters gave the same doughy sensation with edema and glands in the mesentery. Considering the course this patient had run, it was decided to resect the area involved. The terminal 18 centimeters of the ileum and the 16 centimeters of the proximal part of the cecum were then clamped off and the ileum and cecum together with the appendix were resected. The cut ends were inverted, and a lateral anastomosis was done. The mesentery was sutured. A Penrose drain was inserted near the suture line. The abdomen was closed and sutured and the patient was sent back to bed.

Macroscopic examination: The examination showed practically the same condition as has been described upon opening the abdomen, except for the fact that the lumen of the ileum had narrowed to such an extent that only a lead pencil would pass through it.

Following the operation, the patient ran a rather stormy course for the first two days but gradually quieted down. There was at no time any fecal discharge from the drainage area. At the end of four days, the Penrose drain was removed and the patient made a very satisfactory convalescence. She was discharged from the hospital approximately fourteen days after the operation. During the course of time, there was a marked improvement in the constipation of which she had complained. Beginning about four days following the operation, she began to have rather normal bowel movements and at the time she was ready to leave the hospital she had begun to put on weight and have normal bowel movements with no cathartics. The last report I had was that she had gained twenty pounds and had gone back to school.

Pathological report by Dr. Frederick Jones: Tissue received for examination consists of terminal ileum, cecum, and appendix. The tissue as a whole feels edematous and doughy. The serosa is pale, grayish red, glistening and smooth. The opening of the ileocecal valve is considerably smaller than normal.

	Red Blood Count	White Blood Count	Hemoglobin	Color Index	Neutrophils	Eosinophils	Basophils	Lymphocytes	Mononuclears	Red Cells
8/22	3,750,000	10,200	47%	0.6	60	2	0.5	21	16	Marked achromia
8/24		8,500			57	1	1.0	21	20	
8/29		12,500			72.5	3.5		16	8	Achromia
9/3	3,920,000	8,400	52%	0.6	68	4	0	14.9	14	
9/10	3,810,000	7,800	47.9	0.6	74	5	0	17	14	Achromia and Polychromatophilia

Urinalysis

	Specific Gravity	Albumin and Sugar	Microscopic
On admission, light amber color, slightly cloudy, acid	1.011	negative	rare pus amorphous urates round and squamous bacteria
September 3, 1936 cloudy amber color acid	1.011	negative	rare pus, round and squamous

On opening the intestine the mucosa is red to grayish red in color except for small areas of deeper red which surround numerous denuded small patches of mucous membranes. These small ulcers have a dark gray center surrounded by an area of hyperemia. These necrotic areas are found in the ileum and cecum, extending for a distance of 17 centimeters into the ileum and approximately 15 centimeters into the cecum.

Microscopic examination of sections from the ulcerated areas present the following picture: The mucosa shows complete necrosis and destruction. This process of necrosis extends through the muscularis mucosa and into the submucosa, but does not involve the circular or longitudinal muscle fibers.

These ulcerated areas are covered with an exudate consisting of necrotic epithelial tissue in which are found numerous polymorphonuclear cells, plasma cells and a few lymphocytes. Toward the base of the ulcers are many newly formed capillaries and young fibroplastic tissue containing numerous plasma cells, lymphocytes and an occasional eosinophil.

There is some edema in the submucosa and the solitary lymph follicles are hyperplastic. Perivascular lymphocytic infiltration is found throughout the submucosa and a few endothelial leucocytes and eosinophils are also noted. Beyond the edges of the ulcers the vessels of the mucosa are dilated and filled with erythrocytes for some distance beyond the ulcer margin.

Diagnosis: Multiple ulcers of terminal ileum and cecum, of unknown etiology.

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

FOUNDED BY RICHARD C. CABOT, M.D.

TRACY B. MALLORY, M.D., *Editor*

CASE 22191

PRESENTATION OF CASE

A forty-four year old American watchmaker was admitted complaining of dyspnea and a "choked-up" feeling.

Ten days before entry the patient developed malaise, weakness, and chilly sensations. He went to work on the following day but suffered from a sensation of fullness in the mid-chest associated with a desire to cough but an inability to do so. He continued to work for two days thereafter although his weakness was progressive and the peculiar sensation in his chest became worse. There was no associated pain but he rapidly became short of breath. A week before admission his chest felt filled up, he became nauseated and vomited a small amount of material which was neither blood stained nor coffee colored. At this time he fainted and remained unconscious for about five minutes. A physician saw him shortly afterward and found that he had a temperature of 103°. There were no chills or additional symptoms. The fever apparently subsided but he remained in bed up to his entrance into the hospital. During this time his dyspnea became much worse as did the "choked up" sensation in his chest. He was able to lie flat in bed but occasionally was compelled to get out of bed and sit up in a chair. Two days before entry he noticed slight involuntary movements of his right hand which lasted for a few moments and then disappeared completely. The patient stated that he had no cough although his wife said that he had had a "bad cough" and mild night sweats for about two months. The cough was nonproductive. There was a loss of about ten pounds during the three or four months preceding admission.

For two years he had suffered frequent frontal headaches and had been taking a proprietary drug two or three times daily as a precautionary measure.

Physical examination showed a well-developed and nourished man who appeared to be acutely ill. The skin was cold, moist and exhibited a pale ashen appearance with cyanosis of the fingers and lips. The pupils were constricted and reacted sluggishly to light and distance. He had been given an opiate prior to his admission. The retinal arterioles were rather tortuous. Oral hygiene was poor and the tongue was dry and coated. The left border of cardiac dullness was 12 centimeters from the midsternal line and the right border 6 centimeters. The apex impulse was palpated about 9 centimeters to the left of the midsternal line. The heart sounds were distant and of poor quality. The rhythm became totally irregular for several minutes at a time during the period of examination. In the intervals the rhythm was perfectly regular. The neck veins were distended with the patient in the sitting position. The blood pressure was 110/80 and during inspiration no sounds were heard over the brachial artery. There were numerous moist râles and wheezing respirations audible in the lower portion of both chests posteriorly and in both axillae. The liver dullness was percussed to a point three fingerbreadths beneath the costal margin although the edge was not felt.

The temperature was 98.6°, the pulse 82. The respirations were 25.

Examination of the urine was negative. The blood showed a red cell count of 4,720,000, with a hemoglobin of 70 per cent. The white cell count was 25,200, 90 per cent polymorphonuclears. A stool specimen showed a faintly positive reaction to the guaiac test. Several sputa examinations were negative for blood and tubercle bacilli. A sedimentation rate was .69 millimeters per minute. A Hinton test was negative. Several blood cultures were negative. A tuberculin test was negative.

X-ray examination showed a large heart shadow. There was an area of consolidation at the base of the right upper lobe and another area of consolidation with hazy margins at the right apex. On the left side there was homogeneous dullness in the lower portion of the lung field. The appearance of the left main bronchus was suggestive of an enlarged left auricle.

The patient's temperature exhibited daily fluctuations between 98° and 103° and the pulse varied between 80 and 120. Shortly after his admission a pericardial tap was done and 305 cubic centimeters of bloody fluid was removed and the patient's condition was considerably improved. The fluid contained 440,000 red blood cells and 7,000 white blood cells, most of which were polymorphonuclears. Cultures of the fluid gave no growth and examination for tumor cells and tubercle bacilli were negative. The paradoxical pulse and venous engorgement previously noted promptly subsided. Several pericardial taps were done thereafter for relief of dyspnea. Between taps the patient had rather constant asthmatic breathing which was relieved along with other symptoms by paracentesis. Five days after entry he complained of pain in the left lower leg. There was tenderness of the calf

muscles on this side and pitting edema of the ankle and foot. This subsided in about one week. Six days later transient coarse friction rubs were audible over both sides of the chest and a leathery rub was heard over the apex of the heart. Shortly afterward he became irrational and on the twentieth hospital day weakness and edema of the right hand and arm were noted. This became moderately more pronounced. A lumbar puncture showed an initial pressure of 380 millimeters with the patient sitting upright. The spinal fluid sugar was 71 milligrams. Only one lymphocyte was found and examinations for globulin were negative. The total protein was 17 milligrams. Another x-ray showed slightly more fluid in the left chest. The heart size and shape were unchanged. The area of consolidation at the base of the right upper lobe had almost disappeared, but the one at the right apex was still present. On the twenty-fourth day the patient had severe pain in the right axilla and posterior chest aggravated by respiratory movements. For several days there had been a palpable and audible wheeze on this side. A thoracentesis was done at the left base and 420 cubic centimeters of bloody fluid was removed. This showed a specific gravity of 1.016 and contained 110,000 red blood cells and 1,600 white blood cells of which 56 per cent were lymphocytes. Smears for tubercle bacilli and other organisms were negative. The patient's discomfort continued and he had periods of disorientation and marked dyspnea. One month after entry a firm nodule about the size of a hickory nut became palpable in the right supraclavicular region. At the same time several firm pea sized nodules were felt in the subcutaneous tissue just lateral to the left nipple at the site of the previous paracentesis. He gradually failed and died one month after admission.

Differential Diagnosis

Dr. Gerald Blake: Will you demonstrate the x-rays, Dr. Hampton?

Dr. Aubrey O. Hampton: The record is inaccurate. It mentions signs of fluid in the first film, but there is no fluid at the base in this first note; whereas it is evident in the second film. There is a rounded area of dullness here in the apex. There is pathology in the whole upper lobe, it appears to me. This lobe is small as one can see by the closely placed lung markings here and there. The heart is very large. None of the usual angles indicating the junction of the various heart chambers are visible, and it very well might be due to pericardial effusion, but the enlargement of the heart to the right is not so much as we would expect if it were due to fluid. We would expect cardiac enlargement plus pericardial disease.

Dr. Blake: Is that consolidation at the apex?

Dr. Hampton: Yes; and it fades at the base. Then he developed fluid at the left base in about twenty days. The heart does not change. This is the left main bronchus which is pushed upward. There is a definite widening of the carina and even though that is a portable film I think we are justified in assuming that the left auricle was dilated.

This is the last film and the area at the right base has almost disappeared but the density of the right apex remains. He has a new shadow here at the left midlung field and the fluid is increased in the left pleural cavity. The changes in the midportion of the lungs may have been infarcts; I do not know why this one in the apex should remain and grow larger if it is an infarct.

Dr. Blake: From this patient's history it appears that he had a nonproductive cough and night sweats for two months previous to entrance, and that he lost ten pounds in weight during the three or four months before coming to the hospital. We may assume, therefore, that his illness began at that time. The sensation of fullness in his chest with a desire to cough and inability to do so is satisfactorily explained by the physical examination showing pericardial effusion. The finding that the effusion was bloody in character at once brings us to a consideration of the conditions which may bring this about. And in addition to the three things looked for while the patient was in the hospital, namely tuberculosis, subacute bacterial endocarditis and carcinoma, we must also consider Hodgkin's disease as a possible cause of such findings before ruling any of these in or out. I would call attention to the suggestion of uremia in this patient, particularly at the end of his illness when he showed coarse friction rubs over both chests and heart apex, increased pressure in the spinal fluid, disorientation, and the presence of bloody fluid in his thorax; as well as his early symptoms of headache, one attack of vomiting with unconsciousness, the very slight involuntary movement of the right hand, and pericardial effusion. All these could very well be explained on the basis of uremia. In spite of the fact that his one urine test was reported normal, and in the absence of blood chemistry reports, I am inclined to believe that his late symptoms are best explained on a uremic basis.

We cannot, however, interpret the x-ray lung findings on this basis, nor the skin manifestations he showed before death. Subacute bacterial endocarditis has to be considered, particularly if we interpret the lung manifestations as evidence of infarcts. However, the lesion at the apex of the right lung is not at all characteristic of infarct, and there is a striking absence of peripheral embolic manifestations as well as

repeatedly negative blood cultures. In addition to this the nodules in the skin cannot be explained by such a diagnosis. Again with regard to tuberculosis the lesions in the lung are not characteristic, and repeated examinations failed to reveal evidences of this condition from the smears or the fluid. Nor could the skin lesions be satisfactorily explained on this basis. Hodgkin's disease must be considered as it is one of the things that may give the type of bloody pericardial fluid which was shown in this case, and may give the skin nodules which were described. The lesion at the apex of the right lung could be satisfactorily explained on the basis of Hodgkin's disease as could the skin nodules. There is, however, an absence of other manifestations of glandular enlargement either in the mediastinum or elsewhere, and a daily rise of temperature over a long period of time is not characteristic of this disease. However, I do not feel that it can be completely ruled out since the manifestations of Hodgkin's disease may be strikingly limited.

The appearance of the lesion at the right apex is fairly characteristic for carcinoma and I believe we can best explain this case on the basis of a primary carcinoma either here or in the mediastinum invading the pericardium, perhaps by direct extension, and later the left pleura and skin by metastasis. In addition to this, there was congestive failure at the start of the illness based on the pericarditis, and possibly an arteriosclerotic or rheumatic heart. There was, I believe, a terminal uremia, and some infection probably in the lung to explain the phlebitis in the left leg. My second diagnosis would be Hodgkin's disease.

Dr. Tracy B. Mallory: Are there any other suggestions?

Dr. Wyman Richardson: Did you examine the brain in this case? I was wondering whether he might not have a metastatic tumor of the brain, probably bronchiogenic carcinoma.

Dr. Mallory: Dr. Bock, you saw this man. Will you tell us your opinion?

Dr. Arlie V. Bock: As Dr. Blake said, the man on admission was in shock, showed evidence of extreme cardiac tamponade and was greatly relieved by paracentesis. The removal of bloody fluid was not of much help, so far as the character of the fluid went, in making a diagnosis. The relative brevity of the history made one think of the possibility of rheumatic pericarditis and pancarditis. He was rather old, had no supporting history, and we ruled it out on that ground. We thought of the possibility of tuberculosis of the pericardium, tuberculous pericarditis, with fluid. Nothing else in the picture seemed to fit that diagnosis. Then the final conclusion was that, in view of the rapidity with which he went downhill, he probably had a malignant process in the background, presumably from a primary lung carcinoma, and that he did have very likely, in view of the earlier symptoms, a left cerebral metastasis.

Dr. John H. Talbott: There are two items not mentioned which are worth noting in regard to this patient. The onset of symptoms was sudden and the duration of symptoms was short. Presumably he was well until only a few days before he came to the hospital. Secondly, the amount of fluid removed from his pericardial sac was interesting. He was admitted about the same time as was a younger man suffering from rheumatic pericarditis with effusion. The physical signs showed about the same degree of effusion in both patients. Yet the amount of fluid removed from this patient was much less than from the boy with rheumatic pericarditis. The amount of fluid removed was progressively less with each tapping, and the physical signs remained unchanged. The signs of constricting pericarditis were very impressive.

Dr. Bock: I think that is an important point in view of the findings. He did not consider himself incapacitated until a very few days before admission and then his presenting story was substernal discomfort and shortness of breath.

Clinical Diagnoses

Malignancy involving the pericardium and the lung.
Bronchiogenic carcinoma?
Metastasis to the brain (left cerebrum)?
Tuberculosis?

Dr. Gerald Blake's Diagnosis

Carcinoma of the lung invading the pericardium.

Anatomic Diagnoses

Carcinoma of the lung with extension to the pericardium, metastases to the brain and left adrenal, and implantation on the thoracic wall.
Pleuritis, acute and chronic.
Pericarditis, acute and chronic.
Pulmonary edema.
Pulmonary atelectasis, left lower.
Edema of the lower extremities.

Pathologic Discussion

Dr. Mallory: The dramatic thing at the autopsy was the appearance of the pericardium. As soon as the sternum was removed we found this enormous, firm pericardial sac. It varied from a centimeter to over 2 centimeters in thickness and I think that perhaps accounts for the peculiarity of the x-ray shadow which Dr. Hampton pointed out. A pericardial effusion, as he pointed out, usually produces more of a

shadow on the right but this man's pericardium was so thick it could not be distended by the fluid. Most of what was seen at x-ray examination was actual cancerous thickening of the pericardial wall rather than effusion. The latter was at no time very great and by the time of autopsy had almost disappeared entirely, and the inner and outer layers of the pericardium were almost completely fused. The question then, of course, came up as to where this tumor was primary. We found a good sized tumor nodule at the apex of the right lung. We dissected down all the major bronchi very carefully and could not find any sign of involvement. We know of course that the vast majority of tumors of the lung take origin in a bronchus and usually in a bronchus of significant size. There is no theoretical reason, however, why it may not arise in one of the small bronchi close to the periphery of the lung, and in that case it would be impossible to prove it in gross. That is what we believe was the case here. In a very careful search of the rest of the body we were able to find tumor in only two other places. There was a metastatic lesion in the brain, as was predicted, and there was also a small metastasis in the adrenal. The cancer could not have been primary in the brain and it is very improbable, it seems to me, that it was primary in the adrenal. That had all the characteristics of metastasis. Our experience here is that adrenal metastases are practically the commonest secondary deposits from primary cancers of the lung.

DR. J. H. MEANS: Dr. Mallory, there was a lesion in the x-ray that looked exactly like a small infarct and apparently disappeared. Was there any explanation for that?

DR. MALLORY: We found one cluster of smaller nodules of tumor in that right lung which we believe were extensions from the primary one, and there was on the edge of the tumor mass an area of infarction in the lung. I also found on microscopic section an organized thrombus, so he may have had an infarct that was healed.

CASE 22192

PRESENTATION OF CASE

A sixty-six year old native male was admitted complaining of inability to pass urine.

Except for occasional nocturia the patient had been well until one year before entry. At that time he began to pass blood with his urine. Occasionally he voided some clots which caused him considerable pain. During this period he noted that he was unable to void while lying on his back but only when on his hands and knees. After two weeks he passed a stone which measured about a quarter of an inch in diameter. Thereafter the hematuria ceased but the patient developed nocturia of five or six times. There was no increase of diurnal urinary frequency or associated dysuria until ten days before admission.

At this time he noted considerable difficulty in initiating micturition and three days later was unable to void at all. He was attended by a local physician who inserted a catheter three times daily for the succeeding week. The patient passed considerable blood and some clots through the catheter. On the night before entry spontaneous urination became possible but the hematuria continued. For the week preceding his entry the patient had nonradiating pain in his right upper quadrant. The character of this pain was not noted.

His past history was negative except for attacks of indigestion for the past forty years.

Physical examination showed a thin, dehydrated old man who appeared to have lost considerable weight recently. The skin was oily and inelastic. Oral hygiene was very poor. Small firm bilateral axillary nodes were palpated. The chest was barrel shaped but the lungs appeared to be clear. The heart was normal. There was considerable tenderness in the right upper quadrant and right costovertebral angle. The prostate was moderately enlarged, particularly the left lobe. It was firm in consistency and smooth.

The temperature was 101.5°, the pulse 90. Respirations were 20.

Examination of the urine showed a specific gravity of 1.010. There was a trace of albumin and the sediment was loaded with red blood cells. The blood showed a red cell count of 3,890,000, with a hemoglobin of 65 per cent. The white cell count was 10,900. The nonprotein nitrogen of the blood was 42 milligrams per cent. The serum protein was 5 grams. A serum calcium was 11.01 milligrams and the phosphorus was 2.92 milligrams.

X-ray examination showed a dense area of calcification, measuring 1 by 0.5 centimeters, in the lower pole of the left kidney. There was mottled increased density in the right side of the true pelvis. Marked arteriosclerosis was evident. The heart was not remarkable but the aorta was tortuous. There was an old tuberculous fibrous process in the right apex. A cystogram showed an irregular filling defect involving the left posterior half of the bladder. The catheter curved about this area. There was a round area of bony condensation in the left wing of the ilium.

On the second hospital day a bilateral vasectomy was done. The patient's temperature subsided to normal but he complained of constipation and gas pains. An indwelling catheter drained well but large pieces of questionable tumor tissue passed through it. On the third

postoperative day the patient vomited 20 ounces of pale, bile free, odorless fluid. Gastric lavage drained 22 ounces of residual content with a similar appearance. An electrocardiogram showed a single auricular premature beat. QRS_1 exhibited a low amplitude, S_2 and S_3 were prominent, and T_1 was flat. Q_4 was absent and T_4 was upright with a concave $S\text{-}T_4$. Two days later at 2:30 a.m. the patient complained of severe epigastric pain and developed repeated vomiting and board-like rigidity of the abdomen. Peristalsis was present but there was marked tenderness in the epigastrium and pelvic peritoneal floor. The white cell count was 23,000 and a plain film of the abdomen showed free gas in the abdomen beneath both leaves of the diaphragm. The patient's temperature rose to 100° but his pulse and respirations remained at 80 and 20 respectively. A laparotomy was performed three and a half hours after the onset of the acute pain.

Differential Diagnosis

Dr. George G. Smith: This is a complicated case because apparently there are two entirely separate factors involving different symptoms. This is the case of a man who entered because he could not pass water. The presenting symptom was hematuria. Two weeks ago he passed a stone after which the hematuria ceased but the patient had difficulty in voiding. He had to be catheterized; this started up a good deal of bleeding. Another complaint was that of nonradiating pain in the right upper quadrant. The only other possibly important factor in the history was that he had had attacks of indigestion for forty years. He was a dehydrated old man. Examination apparently showed not much that gave us any clue. The prostate was moderately enlarged, particularly the left lobe. It was firm in consistency and smooth. He had some fever and there was blood in the urine. He had some anemia. There was no great increase in the nonprotein nitrogen, which was 42 milligrams. The serum protein was somewhat low. The serum calcium was 11 milligrams, phosphorus 2.92, not particularly remarkable.

X-ray examination showed a dense area of calcification in the lower pole of the left kidney, and mottled increased density in the right side of the true pelvis. There was marked arteriosclerosis. A cystogram showed an irregular filling defect involving the left posterior half of the bladder. The catheter curved around this area. There was a round area of bony condensation in the left wing of the ilium. Of course, we must look at this patient with the eyes and ears of the people who examined him. They did not state that the prostate was stony hard, which would have been suggestive of carcinoma; they say merely it was firm in consistency, and smooth. I should interpret that finding as meaning a hypertrophied prostate and not a malignant one. The cystogram shows a definite irregular filling defect involving the left posterior half of the bladder around which the catheter curved. It seems to me that if we take that at its face value we have to believe that there was a tumor of the bladder on the left side. The mottling and density in the right side of the true pelvis would be much easier to explain if they were on the same side as the filling defect in the bladder. In that case you would say that he had tumor of the bladder with calcium deposit in it. But seeing it on the other side makes one feel it has nothing to do with that condition in the bladder. As far as the examination goes, our diagnosis must be entirely guesswork. Urologists are perhaps fortunate in that they can get a much clearer picture of a case from the use of intravenous pyelograms and cystoscopy, than one can get in certain other branches of medicine, but here we are deprived of these aids to diagnosis. We do not know what an intravenous pyelogram would show. We do not know what the cystoscope would show. If we had this patient we would not be rash enough to make a definite diagnosis without knowing the result of these examinations. So we are forced to guess on the evidence we have here. That evidence would seem to show that the patient had a stone in the lower pole of the left kidney and apparently a tumor of the bladder near its base and on the left side. Why he has pain in the right costovertebral angle is difficult to explain. If the pain were on the same side that the tumor of the bladder was, one would explain it on the basis of obstruction of the lower ureter, but it is on the opposite side. If he has a tumor of the left base of the bladder, and has serious difficulty with his right kidney, one would not expect his nonprotein nitrogen to be so nearly normal as it is.

They did a bilateral vasectomy on him which is now preliminary to practically all prostatic and bladder operations.

He had an electrocardiogram but I do not know what it means. I do not believe it is important on the basis of this history.

"Two days later he had sudden severe epigastric pain and developed repeated vomiting and board-like rigidity of the abdomen." The only explanation that I can give, and it seems to me a perfectly obvious explanation of the abdominal condition, is perforation of a hollow viscus. With free gas in the abdominal cavity, sudden severe epigastric pain and board-like rigidity, I should think of a perforated gastric ulcer, possibly a duodenal ulcer, which might hook up with a history of attacks of indigestion for the past forty years. I can see no reason to think that this gastric condition or perfora-

tion is connected with his urinary condition. I remember one patient—I do not know whether this is the one — who developed an ulcer in his cecum, a perforating ulcer, and there was no cause found for it. The history sounds a little like this but I do not remember what the other factors were, except that I think he did have a tumor of the bladder.

On the evidence that we have, I should say we may diagnose a left renal calculus, a tumor of the bladder, and a rupture of a hollow viscus which, from the location of pain, I should think was probably in the stomach or duodenum. The condition of the right kidney, the cause of pain in the right kidney, I am unable to determine on the basis of the facts which we have at hand.

X-ray Interpretation

Dr. George W. Holmes: There are several films missing in this case. Examination of the chest shows large bright lung fields suggesting a moderate amount of emphysema. The heart is not noticeably enlarged and the aorta is not unusually tortuous for a man of his age. We have not got the film of the upper part of the urinary tract to show the shadow described there. The shadow seen in the other films does not look like stone, but more like an undissolved pill in the gastrointestinal tract. The interesting thing in the x-ray examination is this ragged filling defect in the bladder shadow with the catheter curved around it as described. That certainly looks like a tumor of the bladder, possibly tumor outside the bladder pressing into it could produce a similar picture; but I think that is unlikely. I doubt if the changes described over the sacroiliac joint and in the sacrum are really important. So far as the x-ray examination goes on the material we have here one would suspect a tumor of the bladder, probably malignant and no more.

Dr. Tracy B. Mallory: Dr. Breed, would you care to comment on the electrocardiogram?

Dr. William B. Breed: The flat T_1 and the upright T_4 would certainly indicate the possibility of a coronary occlusion some time in the past.

Dr. Mallory: Dr. Colby, have you any comment?

Dr. Fletcher H. Colby: The only comment I have to make is that I am glad to see a genito-urinary surgeon make a diagnosis without cystoscopy. This man was in very poor condition when he came in on the ward and that is why he was not cystoscoped.

Clinical Diagnoses

Peptic ulcer with perforation.
Peritonitis.
Neoplasm of the bladder.
Renal calculus (left).
Chronic myocarditis.
Bronchopneumonia?

Dr. George G. Smith's Diagnoses

Peptic ulcer with perforation.
Tumor of the bladder.
Renal calculus.

Anatomic Diagnoses

Gastric ulcers, multiple.
Operative wounds: Closure of a perforated gastric ulcer; bilateral vasectomy.
Lobar pneumonia with multiple abscesses, bilateral.
Carcinoma of the bladder with necrosis and extension to the left ureter.
Renal calculus, left.
Pyelonephritis, left.
Pyoureter, left.
Cardiac infarct, old healed.
Arteriosclerosis, marked coronary with occlusion of left descending branch, and marked aortic.
Pericarditis, chronic fibrous.
Pulmonary emphysema, compensatory, bilateral.

Pathologic Discussion

Dr. Mallory: This man was operated on and a perforated ulcer on the posterior aspect of the pyloric ring was found and sutured. He then developed signs of pneumonia and died in the course of a few days.

The autopsy showed, besides the sutured ulcer, two other ulcers on the anterior wall; all of them practically in the pyloric ring, so that he had three gastric ulcers in all. The peritoneal cavity was almost perfectly clean. He had taken care of the infection there perfectly well. He did have extensive pneumonia with early abscess formation in the lungs, however. He had complete closure of the descending branch of the left coronary artery and an infarct of the heart, an old one. In the genito-urinary tract we found a stone in the left kidney with a completely atrophied kidney on that side and a dilated pelvis full of pus. The bladder itself showed a fairly extensive epidermoid carcinoma which had grown up the left ureter for a distance of about two centimeters.

A Physician: Was there anything to explain the pain in the right kidney?

Dr. Mallory: Absolutely nothing.

A Physician: Could compensatory hypertrophy of the kidney produce it?

Dr. Mallory: Sudden stretching of the kidney capsule will certainly produce pain but I would not suppose that compensatory hypertrophy would occur rapidly enough. If it did, contralateral pain should be the rule following surgical nephrectomies.

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THE ENACTMENT OF HOUSE BILL 34*

THE passage of House 34, as amended in House 1720, represents the most important step in the progress of medical licensure in Massachusetts, since the establishment of the Board of Registration in Medicine in 1894.

The purpose of the Bill is to give increased protection to the health of the people of Massachusetts by raising the statutory requirements for qualification for the practice of medicine and this purpose would seem to have been clearly enough expressed in the original draft. The substantive objections, apart from the allegation that no legislation at all was necessary, were that insufficient protection by specific phrasing was provided for aggrieved applicants or aggrieved schools. The amendments have met these objections and a long step forward has been taken by Massachusetts.

So important is this legislation and so signal is the victory that there is glory enough for all who have participated in assisting the Bill on its difficult way. Where so many persons have been interested in advancing the Bill, it may seem invidious to name any individuals, but it is not out of place to designate those acting in official capacity.

In the first place, chronologically speaking, the Board of Registration in Medicine deserves credit for persistently making the recommendation for change in the law in its annual report for a number of years, and for introducing a bill each year incorporating the recommendation, in spite of the discouraging outlook.

At the Hearing on the Bill, the Massachusetts Medical Society eloquently voiced its support through its President, Dr. Mongan, and the medical profession deserves great credit for its constant efforts, made not only through the officers of the Society, but through the individual members also, who by personal representations to members of the General Court accomplished so much in removing misunderstanding, overcoming prejudice and making clear the fundamental issue.

The Joint Legislative Committee on Education, under the Chairmanship of Senator Miles, the only physician in the Legislature, who has always vigorously supported the Bill, reported this Bill favorably, for the first time since the matter came up for legislative consideration. The House promptly approved the Bill, on second reading by a vote of two to one, and on third reading three to one. In the Senate the Bill was received unfavorably but on reconsideration gained strength as its true significance became better understood and on third reading the vote was two to one. The amendments in the House were accepted in the Senate where several more were added, the Bill gaining strength steadily as the discussion was prolonged, the House vote for enactment being four to one. Thus the supporters of the Bill in both House and Senate deserve great credit for their persistent efforts, for their willingness to accept strengthening amendments, and for their firmness in rejecting nullifying or invalidating proposals, which were made frequently by the opposition.

Then His Excellency, Governor Curley, deserves great credit for his insistence that the health of the people should be protected by the establishment of reasonably high minimum standards of medical education to be enforced by state control through a board of approval of medical schools; for his insistence that Massachusetts should take its proper place with the other states in exercising control over the medical education given to candidates who desire registration for practice; for his insistence that steps should be taken to make the Massachusetts license to practice medicine such that it will be accorded general recognition; for his insistence that medical schools chartered by the General Court shall become such that they

*The text of the bill appears on page 949 of this issue.

will be recognized by state boards of licensure throughout the United States: finally for his insistence that all these ends shall be accomplished by a procedure which is just to the medical school, just to the applicant who seeks to practice medicine, and most important of all, just to the patient whose confidence that the physician licensed by the state is really qualified and worthy of his trust, must not be betrayed.

In short the passage of this Bill reflects great credit on all who have supported it, and who have by their efforts placed Massachusetts where it belongs in the onward march toward better medical care for all the citizens of the Commonwealth.

THE HOUSSAY LECTURES

In 1911 the Index Medicus recorded the name of Bernardo A. Houssay as the author of an article entitled "Contribucion al estudio de la accion de los extractos hipofisiarios; ensayo sobre la glándula cardio vascular del lobulo posterior." This appeared in a Mexican publication. As so often happens, this title of his first paper gave a definite indication of the direction which his interests would take. Since then the number of and wide range of learning demonstrated in his publications have been little less than phenomenal.

Professor Houssay has not only headed the department of physiology in the Faculty of Medical Science at Buenos Aires since 1919, and built up from very small beginnings a department which ranks with the best in the world, but together with his associates and pupils has contributed much of the best and earliest work in many important fields of physiology.

Endocrinology in general, and especially that part of it concerning the pituitary, has been the focus of his greatest endeavor. This field is a particularly difficult one to study and one in which purely objective studies leading to definite, but conservative conclusions, are all too rare, compared with the volumes of speculative, poorly controlled work that has appeared from certain sources. Professor Houssay's studies are never in the latter category and are all extremely valuable to the person who is working and studying any phase of medicine in which this gland is important.

The important relationship of the pituitary to the pancreas and to other glands has been the subject of some of his most valuable work. This type of study which goes to the roots of the physiology of such diseases as diabetes and hyperthyroidism is of fundamental importance to the practicing physician who sees such cases.

Unfortunately for many workers in the United States practically all Professor Houssay's publications have been in Argentine, French, and Spanish Journals, many of which are not widely available in the United States even to those few students who can read Spanish. Last fall he made an extended tour in this country when he gave lectures under the Dunham Foundation at Harvard, the Lane Foundation at Leland Stanford, the Herter Foundation at Johns Hopkins, and the Eastman Foundation at Rochester. He also gave a Harvey lecture in New York and other lectures at the Universities of Chicago and of Pennsylvania, the Academies of Medicine at Los Angeles and San Diego, and before the American Association for the Advancement of Science. Next fall he is coming back to Boston as an honored invited guest to the Harvard Tercentenary and will take part in a symposium on "Various Aspects of Biology" at the Medical School on September 8.

The *Journal* has been fortunate in securing the lectures, delivered on his recent trip, for publication, and the first of the series appears in this issue. These articles will be the first, by Professor Houssay, to appear in the English language and will give a summary of his most important work. They also give most extensive references to his own and other original articles in this field taken from a wide survey of the world literature on the subjects. Reprints of the whole series, bound together, will be available for sale at a reasonable price soon after the whole series has been published. The exact price will depend on the probable demand. It is desirable that those who wish to apply for copies of these lectures do so promptly so that the demand can be gauged. Please apply to the *Journal*.

CUSHING'S "JOURNAL"

Harvey Cushing is the outstanding living American physician, both in surgery and in literature. Many years ago, he took a special field of surgery as his own. Building on the slender foundations of his predecessors—Horsley, MacEwen and Keen—he, almost single-handed, erected a substantial structure, now copied all over the civilized world. Thus he rightfully takes his place as a world figure, honored wherever medicine progresses. In literature, his "Life of Sir William Osler" has found a permanent place, one of the best of medical biographies. To those accomplishments he has now added another, perhaps, a hundred years from now, to be considered his most enduring effort. "From a Surgeon's Journal"* is his diary of his war-time experience, written under the stress of conditions in the field. Ships at

*Reviewed on page 959.

sea, hospitals being formed in America and in action overseas, front-line dressing stations, the mud of Flanders, gassed and wounded troops, men with "chickens" on their shoulders and men without, bombing, illness and a host of friends and associates,—the pictures are deftly painted with the sure hand of a great surgeon and the clear eye of a penetrating, and yet sympathetic, mind. To those who shared, this fine book comes as an old friend, to sit by the fireside with in a reminiscent mood, telling tales of bygone days. To the others, and particularly those boys too young to share, the diary presents a truthful picture of events which one hopes they will never see duplicated.

MILK COMPANY OFFICIALS INDICTED

It is now common knowledge, as well as a source of widespread amazement and concern, that the chief officials of the Whiting Milk Companies have been indicted by a Suffolk grand jury for distributing in large quantities, as fresh cow's milk, a grossly adulterated substance. During the milk shortage which accompanied the March floods, according to the contention of the Boston Health Department, the Whiting Milk Companies conspired to manufacture a product from an inferior grade of Dutch skimmed milk powder and rancid South American butter; over 100,000 quarts of this fluid were sold to chain stores in the poorer districts of Boston *as pure milk*, and indeed, so great was the supply of this spurious product that new markets were sought for its disposal!

We do not know how the criminal courts will decide this issue, nor should any case be judged until the evidence is submitted and the jury has rendered its verdict, but if this charge is substantiated, as gross a case of the sacrifice of public welfare to private greed will have come to light as has been heard of since pure food laws were first enacted. Unfortunately the record of this great concern, in which so many people have placed their confidence in the past, is not entirely clean, since in 1932 the Whiting Milk Companies were convicted of adding a foreign substance to milk and paid a substantial fine.

The public has a right to expect that the dispensers of food products should consider themselves as administering a public trust. Laws have been placed upon the statute books further to safeguard the public's rights and the public health. We trust, for the sake of common decency, that these charges will prove unfounded. If the defendants are found guilty, however, then the public has a right to expect that full justice will be done to it.

THIS WEEK'S ISSUE

Contains articles by the following named authors:

Houssay, Bernardo A. Professor of Physiology, Faculty of Veterinary Medicine, University of Buenos Aires, 1910. M.D. Faculty of Medicine, University of Buenos Aires 1911. Professor of Physiology, Faculty of Medical Sciences, University of Buenos Aires 1919-. His subject is What We Have Learned from the Toad Concerning Hypophyseal Functions. Page 913. Address: University of Buenos Aires, Buenos Aires, Argentina, S. A.

Schube, Purcell G. B.A., B.M., M.D. University of Cincinnati College of Medicine 1929. Formerly, Interne, Cincinnati General Hospital. Resident, Good Samaritan Hospital. Fellow, Neuropsychiatry, Colorado Psychopathic Hospital, Denver, Colo. Assistant Physician, Neuropsychiatric Institute and Hospital, Hartford Retreat, Hartford, Conn. Now, Physician-in-Charge, Psychiatric Clinic, Boston State Hospital. His subject is A Study of the Use of Coramine in Dealing with the Effects of Barbituric Acid Derivatives. Page 926. Address: Boston State Hospital, Dorchester Centre, Mass.

Rothschild, David. B.Sc., M.D. McGill University, Faculty of Medicine 1922. Senior Physician and Director of Research, Foxborough State Hospital. Consulting Neuropsychiatrist, Brockton Hospital, Brockton, Mass. Address: Foxborough State Hospital, Foxborough, Mass. Associated with him is

Sharp, Morris L. M.D. Tufts College Medical School 1932. Junior Assistant Physician, Foxborough State Hospital. Address: Foxborough State Hospital, Foxborough, Mass. Their subject is Frequency of Active Tuberculosis in a Hospital for Mental Diseases. Page 929.

Little, Rufus R. A.B., M.D. University of Pennsylvania Medical School 1930. Assistant Physician, North Reading State Sanatorium. His subject is Congenital Defect of the Pectoral Muscles. Page 934. Address: North Reading State Sanatorium, North Reading, Mass.

Corriden, Thomas F. M.D. University of Vermont College of Medicine 1920. F.A.C.S. Consultant in Surgery, Veterans Administration Facility Hospital, Northampton, Mass., No. 95, and Northampton State Hospital. Surgeon, Cooley Dickinson Hospital, Northampton, Mass. His subject is Acute, Ulcerative, Terminal Ileitis and Colitis. Page 936. Address: 16 Center Street, Northampton, Mass.

The Massachusetts Medical Society

SECTION OF OBSTETRICS AND GYNECOLOGY*

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BREECH DELIVERY 2

The operation of breech extraction bears the same relation to a breech presentation as does forceps delivery to a vertex presentation, and has, in strict interpretation, the same indications, e.g., conditions which demand prompt termination of labor in the interest of either mother or child. As with forceps delivery, breech extraction should be carried out only:

1. When there is no disproportion between the infant and the maternal pelvis.
2. When the os is fully dilated in relation to the presenting part, and the membranes have ruptured spontaneously or have been ruptured as a preliminary step.
3. When the patient is under the relaxation of full anesthesia.
4. When adequately trained assistance is at hand.

Since the details of these conditions have been considered in the previous section of this communication it remains only to discuss the technic of extraction, which, save in the matter of the management of the submechanism of the breech, is identical in frank, full, and footling presentations.

1. Under full anesthesia and with the vulva and perineum aseptically prepared, the feet of the infant should be grasped. This step is simple in the full and double footling presentations, as the feet are low in the birth canal and may even be at the vulva. In frank breech presentations, where the hips are flexed and the knees extended, the feet should be secured by the Pinard maneuver. To do this the perineum should first be dilated until the entire hand can be passed into the vagina. The right hand should be selected when the baby's back lies to the mother's right (R.S.A. and R.S.P. positions), the left when the position is L.S.A. or L.S.P.; in each case the palm of the hand inserted will face the infant's belly and the posterior aspect of its thighs. By making pressure on the posterior aspect of the thigh, thereby hyperflexing the hip and tensing the hamstring muscles, the leg will flex at the knee and the foot will prolapse within the grasp of the hand. It is well, in this step, to bear the following points in mind:

   a. The breech must be pushed up above the pelvic brim in order to make room for the maneuver.
   b. The umbilical cord will usually be felt, and, if wrapped around a leg or if between the legs, should be disengaged and displaced upward out of the way.
   c. The maneuver should be carried out between uterine contractions.
   d. Each step should be effected methodically and without haste.
   e. Both legs should be secured.

In single footling presentations, where the anterior foot is prolapsed, it is not essential to flex out the posterior leg. When, however, the posterior foot presents, it is better judgment, in all cases, to secure the anterior by the method above described, as attempts to deliver a breech by traction only on the posterior leg may result in delay, due to the tendency of the infant to straddle the maternal symphysis.

2. After both feet have been secured, traction should be made on both of them obliquely downward toward the floor, exerting moderate pressure on the perineum. The use of a sterile towel to grasp the feet will provide a secure grip. As the knees appear the grip should be shifted upward on the legs, thence upward to the lower thighs after the knees are born. The anterior hip of the infant will be rotated to the pubic arch by the resistance of the pelvic floor, and will soon be identified beneath the pubis; traction upward will now deliver the posterior hip over the perineum.

3. Shifting the grip upward to grasp the hips, traction is now continued obliquely downward, *rotating the baby's back upward and keeping it upward until time for delivery of the shoulders;* for by so doing the shoulders are brought into relation with the widest transverse diameter of the pelvic inlet through which they are about to pass. As the umbilicus passes over the perineum the cord should be pulled down several inches from above in order to allow slack for the balance of the delivery.

4. No attempt should be made to deliver the shoulders or arms until the scapulae can be either seen or definitely palpated beneath the arch. The grip is then shifted upward to embrace the thorax of the baby, and the anterior shoulder is rotated ninety degrees to the arch, keeping the body well downward against the perineum. Usually the arm will be found well flexed alongside the thorax, and the elbow is swept out by the operator passing two fingers over the shoulder, fixing the tips in the antecubital region, and splinting the humerus,

*A series of short selected articles by members of the Section is being published weekly.
Comments and questions by subscribers are solicited and will be discussed by members of the Section.

as he presses with the digital phalanges. The infant is now rotated one hundred and eighty degrees on its long axis, keeping the back uppermost, one hand over the delivered shoulder, and the other on the opposite side of the thorax to effect rotation; the shoulder which was originally posterior is now anterior, and the arm is delivered as above described.

Should the anterior shoulder prove to have an extended arm, attempts to deliver the latter should be postponed. The posterior shoulder should be made anterior without delay, the act of rotating serving to wipe the arm, if originally extended, down across the face; the shoulder originally anterior, now posterior, is again made anterior, when it will be found to have been also wiped down across the face and to lie alongside the thorax. *At no time during rotation should traction be made, and at all times the back should be kept uppermost.*

5. The arms once delivered, the towel used for traction should at once be discarded. For a right (left) handed operator the infant should be now laid face downward astride his left (right) forearm. The index and middle fingers of his left (right) hand are passed into the vagina and into the mouth of the infant to be used to guide the chin over the perineum. The right (left) palm seeks the cephalic prominence above the symphysis and steadily presses the baby's occiput into the pelvis, while the left (right) arm raises the body upward over the pubic region. This maneuver suffices to flex the head over the perineum in most multiparae; should it not suffice, a deep mediolateral episiotomy should be done without delay, a step which should be the rule with a primiparous breech extraction. If, despite this, the head does not descend and flex easily, the baby's feet and legs should be grasped in a sterile towel by an assistant and the body held high in front of the vulva; no time should then be lost in application of forceps to the aftercoming head and flexion by this means over the perineum.

Considerations of space do not permit an extended discussion of the pathological aspects of breech delivery. Sufficient has been described, however, to indicate that a successful outcome of this type of labor must be predicated upon the principle of eternal study and vigilance, and upon judgment and operative ability which can be acquired only by training and experience.

THIRD ANNUAL POSTGRADUATE MEDICAL EXTENSION COURSE

The following sessions have been arranged by the Committee for the week beginning May 10:

Berkshire

Thursday, May 14, at 4:30 P.M., at the House of Mercy Hospital, Pittsfield. Subject: Lung Diseases (Medical) — (a) Differential Diagnosis and Treatment of Lobar Pneumonia. (b) Symptoms and Signs in Chronic Lung Disease; Tuberculosis, Bronchiectasis, etc. Instructor: S. H. Proger. Melvin H. Walker, Jr., Chairman.

Bristol North

Wednesday, May 13, at 7:30 P.M., at the Morton Hospital, Taunton. Subject: Medical Economics. Instructor: C. Frothingham. Arthur R. Crandell, Chairman.

Bristol South (New Bedford Section)

Friday, May 15, at 4:00 P.M., at the St. Luke's Hospital, New Bedford. Subject: Syphilis and Gonorrhea — Syphilis: Modern Treatment. The Use of Neosalvarsan, Tryparsamid, Bismuth, Mercury, Potassium Iodide, etc., in Office Practice. Gonorrhea: Treatment of Complications as Seen in General Practice. Instructors: A. W. Cheever and N. A. Nelson. Harold E. Perry, Chairman.

Franklin

Wednesday, May 13, at 8:00 P.M., at the Franklin County Public Hospital, Greenfield. Subject: Psychiatry — Psychobiology in General Medicine. Instructor: K. J. Tillotson. Halbert G. Stetson, Chairman.

Middlesex East

Wednesday, May 13, at 4:00 P.M., at the Melrose Hospital, Melrose. Subject: Diseases of the Liver—Hepatitis and Painless Jaundice. Problems in Diagnosis and Treatment. Instructor: C. M. Jones. Joseph H. Fay, Chairman.

Middlesex North

Friday, May 15, at 7:00 P.M., at the Lowell General Hospital, Lowell. Subject: Lung Diseases — (a) Significance of Symptoms and Signs in Chronic Lung Disease; Tuberculosis, Bronchiectasis, etc. (b) The Value of Surgery in Above Disease Problems. Instructors: H. F. Newton and D. S. King. Leonard C. Dursthoff, Chairman.

Norfolk

Friday, May 15, at 8:30 P.M., at the Norwood Hospital, Norwood. Subject: Pediatrics (Surgical)—Abdominal Disease in Childhood. Instructor: H. W. Hudson, Jr. H. B. C. Riemer, Chairman.

Worcester (Milford Section)

Wednesday, May 13, at 8:30 P.M., at the Milford Hospital, Milford, Subject: Ophthalmology and Otolaryngology—(a) The Major Hazards in Diagnosis of Disease of the Eye, Ear, Nose and Throat as Seen in General Practice. (b) Special Treatment in Acute Medical and Traumatic Diseases of the Eye. Emergencies Arising in the Treatment of the Ear, Nose and Throat. Instructors: T. Gundersen and F. L. Weille. Joseph I. Ashkins, Sub-Chairman.

MASSACHUSETTS LEGISLATIVE NOTES

House 34 has been amended under House 1720 by striking out all after the enacting clause and inserting in place thereof the following (which includes the recommendation of His Excellency, the Governor):—

"SECTION 1. Section two of chapter one hundred and twelve of the General Laws is hereby amended by striking out the second sentence, as appearing in section one of chapter one hundred and seventy-one of the acts of nineteen hundred and thirty-three, and inserting in place thereof the following:—

"Each applicant who shall furnish the board with satisfactory proof that he is twenty-one or over and of good moral character, that he possesses the educational qualifications required for graduation from a public high school, that he has completed two years of pre-medical collegiate work, including physics, chemistry and biology, in a college or university approved by a body consisting of the secretary of the board, the commissioner of education and the commissioner of public health, in this section referred to as the approving authority, that he has attended courses of instruction for four years of not less than thirty-two school weeks in each year, or courses which in the opinion of the board are equivalent thereto, in one or more legally chartered medical schools, and that he has received the degree of doctor of medicine, or its equivalent, from a legally chartered medical school having the power to confer degrees in medicine and approved by the approving authority, shall, upon payment of twenty-five dollars, be examined, and if found qualified by the board, be registered as a qualified physician and entitled to a certificate in testimony thereof, signed by the chairman and secretary. An applicant aggrieved by the refusal of the approving authority to approve a medical school under this section shall be entitled to have the reasonableness of such refusal reviewed by a justice of the superior court, whose decision shall be final.

"SECTION 2. Said section two of said chapter one hundred and twelve, as amended, is hereby further amended by adding at the end thereof the following three new paragraphs:—

"The approving authority shall, upon the request of any college, university or medical school in this commonwealth, inspect said college, university or medical school and notify its trustees or other governing body in writing if said college, university or medical school is approved by the approving authority for the purposes of this section, or if not, what steps said college, university or medical school must take in order to gain the approval of the approving authority.

"Any college, university or medical school desiring to be approved for the purposes of this section may file with the approving authority a written request for the approval of such college, university or medical school, and thereupon a public hearing shall be seasonably granted by the approving authority and a written decision made by it within twenty days after the termination of such hearing and the applicant for such approval shall be notified of such decision. A written decision of the approving authority refusing to approve any college, university or medical school shall not become effective until thirty days after written notice of such decision is given to the college, university or medical school seeking such approval. Every such college, university or medical school aggrieved by such refusal shall have the right to file a petition in the superior court for Suffolk county to revise or reverse the decision of the approving authority. Notice of the entry of such petition shall be given to the secretary of the board of registration in medicine and all proceedings connected therewith shall be according to rules regulating the trial of civil causes without juries. The court shall hear the case and finally determine whether or not such approval shall be granted or revised.

"Upon the filing of such a petition within the aforesaid period of thirty days, then the said decision of the approving authority shall not become effective until a final decree affirming said decision is entered upon the aforesaid petition.

"SECTION 3. The provisions of said section two of said chapter one hundred and twelve as existing immediately prior to January first, nineteen hundred and thirty-nine shall continue to govern as to the eligibility of any applicant for registration as a qualified physician who shall have matriculated prior to said date in any legally chartered medical school having power to confer degrees in medicine, but subject, however, to the provisions of section two of chapter one hundred and seventy-one of the acts of nineteen hundred and thirty-three.

"SECTION 4. For purposes of examination and registration of applicants and of approval of medical schools, osteopathic schools recognized by the American Osteopathic Association shall have the same standing before the board of registration in medicine, and the approving authority provided for in section one, as medical schools recognized by the American Medical Association.

"SECTION 5. The approving authority provided for in section one shall, within three months after the effective date of this section, publish the qualifications that said authority will require of a college, university or medical school in order that it be approved under section one.

"SECTION 6. The provisions of this act providing new eligibility requirements for applicants for registration as qualified physicians shall become effective January first, nineteen hundred and thirty-nine."

HOUSE 1759

Reported on Senate 321. A new draft as below.
Resolve reviving and continuing the special commission on public health laws and policies.

Resolved, That the unpaid special commission, established under chapter eleven of the resolves of

nineteen hundred and thirty-five, for the purpose of studying and investigating the public health laws and policies of the commonwealth, is hereby revived and continued, and said commission is hereby directed to study the subject matter of the House resolve printed as Senate document number three hundred and twenty-one of the acts of the current year relative to construction of a new hospital for the treatment of infantile paralysis and arthritis. The final report of said commission shall be filed with the clerk of the House of Representatives on or before the first Wednesday of December in the current year.

Senate 24. April 29. Report leave to withdraw. Accepted in Senate (Final). The bill was designed to abolish the several Boards of Trustees of institutions in the departments of Mental Diseases and Public Welfare.

MISCELLANY

CONNECTICUT NEWS

The Fairfield County Medical Association held its 144th annual meeting in Bridgeport on Tuesday, April 14, 1936. At this meeting the following officers were elected for the year 1936-37:

President—John Shea, M.D., Bridgeport.
Vice-President—John H. Staub, M.D., Stamford.
Secretary—R. Harold Lockhart, M.D., Bridgeport.
Treasurer—Clifton C. Taylor, M.D., Bridgeport.
Councilor—James D. Gold, M.D., Bridgeport.

After an active business session the members were addressed by Dr. Walter S. Lillie, Professor of Ophthalmology, Temple University, on "Ophthalmological Changes Produced by Intracranial Lesions," and by Dr. Temple Fay, Professor of Neurological Surgery, Temple University, on "The Diagnosis of Cerebral Tumors."

Dr. Harry L. F. Locke has been appointed chairman of a special committee of the health division of the Hartford Chamber of Commerce which will direct participation for the third year in National Child Health Week. During this Child Health Week, an outgrowth of the dedication by Herbert Hoover, while president, of May 7 to better and healthier children, the care of the teeth will be stressed.

The health committee has pledged support to a dental health program initiated by the State Department of Health and to the plan of the local Department of Health for a campaign during May to immunize preschool children against diphtheria.

In 1933 the Chamber of Commerce endorsed the first Oral Hygiene program conducted by the Hartford Dental Society during Child Health Week. This present campaign will point out the value of dental care by means of posters and talks.

The special commission created by the last session of the General Assembly to study and inquire into the present financial responsibility act of Connecticut, with the purpose of suggesting alterations, amendments, or revisions of the act, has been sitting almost weekly since August, 1935. Suggestions have been solicited from many groups of citizens whose activities the present financial responsibility law has in some manner or form touched or controlled. Coroners, hospital managers, doctors, welfare administrators, officials of the State of Massachusetts, casualty company executives, all these and many more have been consulted and the suggestions offered run the whole distance from the proponents of the compulsory insurance idea down to the proponents of the theory of more restricted issuance of registrations and licenses to drivers.

That the topic is a timely one and that the conclusions of the committee will be awaited with interest is manifest on all sides. The State of New York has recently had a commission studying the same or similar subjects; various other commonwealths of the country are canvassing the situation and within the past ten days the State of Maine appointed a commission to study the problem.

There is a tendency in many states to pattern their laws after the Connecticut Responsibility Act and there is a feeling that Connecticut's contribution to the present discussion will bear considerable weight.

Mental Hospitals and the Public

The present relationship between the mental hospital and the community holds much that is fundamentally wrong, according to Dr. C. C. Burlingame, Psychiatrist-in-Chief of the Neuropsychiatric Institute of the Hartford Retreat. "This basic relationship will have to be changed before a better order of things can come. We, as workers in the field, have been too willing to remain as little isolated patches, or, may I say, detached artificial communities within a civilization of which, to a surprising degree, we have failed to be a real part.

"As a corollary, I might well indict the social order which continues to expect to solve the great problem of mental and nervous illness and yet allow the mental hospital to remain in such an isolated, detached relationship to the remainder of the present-day social structure and body politic.

"Those responsible for mental institutional care cry out against the indifference on the part of the public, against low appropriations, against the indifference to the sufferer from mental illness as opposed to the generosity to the sufferer from physical illness.

"In other words, the hospital for mental illness must not be a negative symbol of defeat from which people turn away in distaste; it must be a positive force in the community, exercising, in an ever-widening sphere of influence for constructive good, a medium for the dissemination of education and a potent factor in breaking down the age-old prejudices against diseases of the mind."

Dr. Burlingame in his annual report emphasized the growth of the Neuropsychiatric Institute during

the past five years, told how it had passed into the most active preventive and therapeutic field, "but what should and does give us the greatest satisfaction is the fact that we have returned a far greater number of people to society who have benefited by their stay.

"We must make mental hospitals more normal, conduct them more normally and more closely simulate appearances, practices and the division of responsibility that obtains in the community at large.

"It is an undeveloped state of mind in the public which has created literally thousands of endowed, general hospitals, backed by private philanthropy and lavish charity, while but a handful of endowed institutions are providing care for mental and nervous cases. That must be changed.

"The general hospitals have a perfect army of friends who come forward and tell of their experiences and express their gratitude, but the mental hospital most often hears only from the paranoid, the disgruntled and the self-seeking, as the army of those who have been helped during a nervous and mental illness, still hesitate to come forward because they fear unenlightened public opinion, and believe that revealing the fact that they have been in a mental hospital is tantamount to dragging the family skeleton from the closet."

The Negro Tuberculosis Death Rate in Hartford

The death rate from tuberculosis in Hartford has dropped sharply during the past fifty years but this decrease has taken place almost entirely among the white population. The white death rate from tuberculosis was ten times as high fifty years ago as it is now. The present colored death rate from tuberculosis, however, is as high as the white rate was fifty years ago and is now ten times as high as the present white rate. While the colored population of Hartford is only about four per cent of the total it accounts for twenty-nine per cent of the tuberculosis deaths.

Fifty years ago the death rate from tuberculosis in Hartford was 365 per 100,000 population; in 1935 it was white 32, colored 363 per 100,000. New Haven for 1935 showed a tuberculosis death rate of white 43, colored 105 per 100,000 population.

In Detroit the colored tuberculosis death rate was reduced from 355 in 1925 to 248 in 1935, chiefly through a program conducted by the colored people. The Detroit Health Bulletin describes this program thus: "While it is true that the colored rate is about six times as high as that of the white group, there is a commendable spirit among the colored people of Detroit to do everything possible to prevent the spread of infection among their people. Several colored physicians have taken special courses to make themselves proficient in the treatment of tuberculosis and several private hospitals have been established for the care of their afflicted. There has been established an organization among the colored people to promote sanitary living conditions, and to encourage the physical examination of all those who give symptoms suspicious of tuberculosis."

Success in Bovine Tuberculosis Eradication Program

After seventeen years of effort Connecticut has become a modified accredited area in the bovine tuberculosis eradication program. The announcement which recently came from Washington means that on the last test less than one-half of one per cent of the cattle in the state reacted positively. This campaign to drive tuberculosis from Connecticut dairy herds has cost $3,250,000. Ninety thousand cattle, equal to one-half the normal cattle population of the state, have been condemned and slaughtered. The completion of this task was made possible by an emergency appropriation of $150,000 granted by the 1935 General Assembly and by additional funds made available through the Agricultural Adjustment Administration at Washington. Since the beginning of this campaign in 1919 Connecticut has spent for indemnities roughly, $2,000,000; the Federal Government has contributed about $1,250,000.

Connecticut now becomes the thirty-ninth state in the country to qualify as a modified accredited area, the last of the New England States except Rhode Island. Its task was more difficult than many other states since it was considered the most heavily infected state in the country, with an average percentage of infection considered conservatively at thirty per cent. As neighboring states made more rapid progress in the early years of the campaign and as rules grew stricter elsewhere, tuberculous cattle were shipped into Connecticut until it became a dumping ground of the unfit.

Hartford County several years ago became the first accredited area in the state, testing in this county being stimulated by the insistence of the Hartford (City) Board of Health that milk must come from tested herds. Tolland and Middlesex Counties followed, then Windham and Litchfield Counties. Within the past few weeks New London, New Haven and Fairfield Counties qualified. All dairy herds within the state are under supervision. If there has been a reactor in the herd at the last test, the herd is tested again in ninety days. Herds without reactors are tested once a year. In every case reactors are condemned and slaughtered.

Flood Conditions in the Hospitals of Hartford

A survey of the four largest hospitals in Hartford since the subsidence of the Connecticut River revealed the fact that varying conditions existed. St. Francis Hospital probably suffered the least since it was without electricity from the plant supplying the city only one night, and during this time it used its own emergency lighting system. The operating room schedule was not curtailed. At the other extreme was Mt. Sinai Hospital with no electric power for six days, after which time it secured current from its own generator installed for the duration of

the emergency, five more days. It was necessary to operate by candle and flashlights.

The Municipal Hospital received no electric power from the usual supply for seventy-two hours, and during this time had no heat. The emergency unit supplied sufficient light to carry on work but only emergency operating was permitted. The Hartford Hospital, the largest in the city, was not dependent on electricity for its heat. It was necessary, however, to use its own electric generating plant for an entire week since this was more reliable although it supplied but one-half the usual load to the hospital. At times the hospital would switch back to the crippled city supply for a few hours at night. Only emergency surgery was done during this period.

Annual Meeting of Hartford County Medical Association

The 144th annual meeting of the Hartford County Medical Association was held in Hartford on the afternoon and evening of April 7, 1936. The afternoon session, opening at 4:30, was concerned chiefly with the reports of officers and committees. Of particular interest among the latter was a report by Dr. Henry N. Costello in which was presented a review of medical legislation in the Connecticut General Assembly from 1919 to 1935. This supplemented a similar report given by the same chairman one year ago in which the period 1911 to 1919 was covered. The afternoon session closed with a résumé of the achievements of the Committee on Tumor Study of the Connecticut Medical Society by its chairman, Dr. Thomas H. Russell of New Haven.

One hundred and fifteen convened at the Hartford Club for dinner. Dr. Arthur B. Landry, retiring president of the Association, presented an excellent paper on "Unfinished Business." Honorable Newell Jennings, Judge of the Superior Court of Hartford County, spoke very entertainingly on "Expert Medical Testimony." Dr. Stephen Rushmore of Boston, guest at the dinner, briefly discussed Judge Jennings' paper.

Thirteen new members were elected to the Association bringing the total membership to 472.

The following were elected to office:

President, Ralph A. Richardson, M.D., Bristol; Vice-President, Maurice T. Root, M.D., West Hartford; Secretary-Treasurer, Stanley B. Weld, M.D., Hartford.

Member of Board of Censors for 3 years, Arthur B. Landry, M.D., Hartford.

Member of Committee on Public Policy and Legislation for 2 years, Aaron T. Pratt, M.D., Windsor.

State Delegates for 3 years, Vincent Mendillo, M.D., New Britain; D. C. Y. Moore, M.D., South Manchester, and William Hanrahan, M.D., Bristol.

The Address on "Expert Medical Testimony," by Honorable Newell Jennings, Judge of the Superior Court of Hartford County

Judge Jennings prefaced his remarks by saying that in looking around for material on this subject he could find very little, in fact there was but one text on the subject in the combined State and County Bar libraries. This was by Lawson and too dry to be readable. He divided his subject into two parts, first, testimony as to fact, and secondly, opinion testimony. Facts are very important in the trial of cases. The physician called to testify cannot help the court and his clients any better than by having a clear grasp of the facts. Medical testimony differs from no other testimony offered in court other than it is given by a physician in the practice of his profession. Testimony as to fact is from observation and is not subject to dispute. The physician's language in court should be simple and couched in such terms that the jury and judge can readily understand. It is important for the physician to remember that he should use plain everyday English in the sense it is used by the juryman and the lay judge. Many physicians' statements have to be translated. This is necessary because his opinion is based on the facts. The facts presented should be accurate and to this end it is of inestimable value that the physician have his records with him.

Opinion testimony, on the other hand, is not permissible in our United States system of jurisprudence but is admitted as a matter of necessity. This is evident in a situation where the facts have been presented to the jury and the jury, in turn, because of its limited knowledge, has no way of forming an opinion. In such a situation the opinion of an expert is allowed.

Opinion testimony may be based on observation or fact, or it may be based on hypothesis. Opinion testimony based on observation is the usual and most important form. According to Lawson, expert medical testimony was formerly as a rule based on hypothetical facts but this is no longer true. Now the most important testimony is based on actual observation. True, two men may look at the same phenomenon and derive therefrom different opinions. The controversy usually arises between the family physician who has had more and longer opportunities of observation of a case and the physician called in by the defendant to testify after making one or two examinations. Juries are often confused but there is nothing more fatal to the trial of a case than to have the jury discover it has been misled. The differences in the opinions between physicians are usually not striking except in mental cases. This is due to the different theories pertaining to mental science, also to the differences between the medical and legal definitions of sanity. Mentally we all differ from the norm in the psychiatrist's eyes but legally there is no such difference, only sanity and insanity. The jury pays attention only to the facts.

Opinion testimony based on hypothesis is not so important as formerly. It was formerly a long drawn-out affair met, if possible, by more numerous and more tedious objections. At present it has fallen into disuse. There are certain kinds of hypotheses which are of value and arise when opportunities for observation have not been satisfactory.

In closing, Judge Jennings referred to the question of a physician's qualification. Many through false or real modesty make it necessary to have dragged out of them their qualifications. The value of a physician's opinion depends on facts and one of the facts is the statement as to his own education and preparation. The most important qualification of the doctor is honesty. About eighty per cent of cases are settled out of court, the remainder are tried because of a difference of opinion. His final plea to the profession was for a clear presentation of facts in English that could be understood, not too concise, but full and complete.

The Sixty-Fourth Annual Report of The Hartford Dispensary

In this document the largest item of income is $29,840.89 contributed by the Hartford Community Chest which together with the payments of patients of $8,093.95, fees by the laity and income of endowments, make a total income of $42,249.46. The disbursements were of an equal amount.

The report of Dr. Stanley B. Weld, Physician-in-Chief, showed that 33,938 treatments were furnished during 1935 as compared with 38,564 in 1934.

The cost per treatment increased from seventy-six cents to one dollar. The number of clinics has increased to twenty-eight.

Middlesex County Medical Association

At the annual meeting of the Middlesex County Medical Association held at the Edgewood Country Club, Cromwell, Thursday, April 9, 1936, the following officers were elected:

President, Louis O. LaBella, M.D.; Vice-President, Harold M. Speight, M.D.; Secretary-Treasurer, G. Mansfield Craig, M.D.

Guest speakers were Philip Woodbridge, M.D., and Samuel A. Marshall, M.D., both from the Lahey Clinic, Boston.

Appointment of Dr. LaBella

On April 6, 1936, Dr. Louis O. LaBella was appointed Health Officer for the city of Middletown.

APPOINTMENTS IN THE HARVARD MEDICAL SCHOOL

The following Harvard Medical School appointments for the year beginning September 1, 1936, have been announced:

Huntington Memorial Hospital

Ernest Merrill Daland—Consulting Surgeon.
Varaztad Hovannes Kazanjian — Consulting Surgeon (Plastic Surgery).
George Adams Leland, Jr.—Surgeon.
Charles Carroll Lund—Surgeon.
George Gilbert Smith—Surgeon (Genito-Urinary).
Grantley Walder Taylor—Surgeon.
Joe Vincent Meigs—Associate Surgeon.
Fletcher Hatch Colby — Assistant Surgeon (Genito-Urinary).
Charles Longdon Parsons—Assistant Surgeon.
Charles Louis Swan, Jr.—Assistant Surgeon.
Arthur Moses Greenwood—Dermatologist.
Clarence Guy Lane—Dermatologist.
Edwards Woodbridge Herman—Laryngologist.
Leroy Allen Schall—Assistant Laryngologist.
Simeon Burt Wolbach — Consulting Pathologist to the Cancer Commission.
Shields Warren — Pathologist to the Cancer Commission and to the Huntington Hospital.
Olive Gates — Assistant Pathologist to the Cancer Commission and to Huntington Hospital.
Merrill Clary Sosman—Consulting Roentgenologist.
Richard Dresser—Roentgenologist.
William Thomas Salter—Associate Physician to the Huntington Hospital and Research Fellow in Biological Chemistry to the Cancer Commission.
Francis Tennery Hunter—Associate Physician.
Henry Jackson, Jr.—Associate Physician.
Austin Moore Brues—Assistant Physician.
John Alfred Calhoun, Jr.—Assistant Physician.
Paul Charles Zamecnik—Resident Physician.
Ira Theodore Nathanson—Lucius Littauer Fellow.
Clark Edward Brown—Lucius Littauer Fellow.
George Herbert Hitchings—Research Fellow.
Robert Harold Oster—Research Fellow.
Joseph Briggs Howland—Administrator.

Cancer Commission

James Bryant Conant, Chairman; Joseph Briggs Howland, Secretary; Charles Sidney Burwell, Elliott Proctor Joslin, Edwin Bidwell Wilson, Simeon Burt Wolbach, Robert Battey Greenough, Channing Chamberlain Simmons, Ernest Edward Tyzzer, Lawrence Joseph Henderson, Hans Zinsser, George Richards Minot, Joseph Charles Aub, William John Crozier.

Advisory Board

James Bryant Conant, Chairman; Charles Jackson, Treasurer; William Perkins Homans, Deputy Treasurer; Joseph Briggs Howland, Secretary; Charles Grey Bancroft, Robert Winsor, Jr.; Alfred Harlow Avery, Phillips Ketchum.

Administrative Committee

Charles Sidney Burwell, Chairman; Joseph Briggs Howland, Secretary; Lawrence Joseph Henderson, Joseph Charles Aub.

THE APPOINTMENT OF DR. FRANK FREMONT-SMITH

Dr. Frank Fremont-Smith, until recently Assistant Professor of Neuropathology at the Harvard Medical School, and Associate Psychiatrist at the Massachusetts General Hospital, was appointed on February 1, 1936, to the staff of the Josiah Macy, Jr., Foundation. Dr. Fremont-Smith will be in charge of the Medical Division, to which he will give full time.

DR. WILLIAM D. McFEE WILL ATTEND THE INTERNATIONAL CONGRESS OF PHYSICAL MEDICINE

Dr. William D. McFee will act as official delegate to the Sixth International Congress of Physical Medicine and Physiotherapy in London, May 12 to 16, representing the Public Health Service of the United States, his appointment having been authorized by President Roosevelt. He will also be the official delegate of the Academy of Physical Medicine and of the New England Physical Therapy Society.

At the Section on Electrotherapy Dr. McFee will present a report on the Present Status of Fever Therapy in the United States by Dr. McFee and Dr. Hosea W. McAdoo.

Dr. McFee has served as Vice-President of the International Association of Physical Medicine and Physiotherapy since his election at the Congress in Liege, Belgium, in 1930.

PHYSICIANS' ART EXHIBITION

The following physicians contributed to the exhibition recently held at the Doll and Richards Galleries, 138 Newbury Street, Boston: E. P. Bagg, Lawrence W. Baker, J. Dellinger Barney, Robert M. Bell, Howard Coggeshall, Frederic J. Cotton, William P. Coues, John R. Graham, Lewis Webb Hill, James C. Janney, Arthur Bates Lyon, James H. Means, Harris P. Mosher, Claude L. Payzant, Hale Powers, Walter F. Sawyer, Somers H. Sturgis, Fritz B. Talbot, Nathan B. Talbot, G. W. Taylor, Sidney C. Wiggin and A. William Reggio.

ONLY ONE CASE OF TYPHOID FEVER REPORTED IN APRIL

According to alleged reports by Dr. Gaylord Anderson of the Massachusetts Department of Public Health, only one case of typhoid fever was reported in Massachusetts during April. That was in Waltham and outside the flood area.

MORTALITY RATES

Telegraphic returns from 86 cities with a total population of thirty-seven millions for the week ending April 18 indicate a mortality rate of 13.2 as against a rate of 12.3 for the corresponding week of last year. The highest rate (23.8) appears for Evansville, Ind., and the lowest (4.9) for Somerville, Mass. The highest infant mortality rate (13.9) appears for New Orleans, La., and the lowest for Cambridge, Mass., Duluth, Minn., Erie, Pa., Long Beach, Calif., Lowell and Lynn, Mass., and Waterbury, Conn., which reported no infant mortality.

The annual rate for 86 cities is 13.6 for the sixteen weeks of 1936, as against a rate of 12.6 for the corresponding period of the previous year.

SUMMARY OF MORTALITY FROM AUTOMOBILE ACCIDENTS

The Bureau of the Census announces that during the four weeks ending April 11, 1936, 86 large cities in the United States reported 567 deaths from automobile accidents. This number (567) compares with 630 deaths during the four weeks ending April 13, 1935. Most of these deaths were the result of accidents which occurred within the corporate limits of the city, although some accidents occurred outside of the city limits.

THE BOSTON PSYCHOANALYTIC INSTITUTE

A little more than fifteen years ago, the necessity for organized teaching according to academic standards, in the new and rapidly developing science of psychoanalysis, became manifest. It was this necessity for systematized training which, in 1920, instigated the establishment of the first Psychoanalytic Institute in Berlin. Previous to this, the usual method of teaching and learning psychoanalysis consisted essentially in undergoing a personal analysis by an experienced analyst. Following the original Berlin plan, there gradually evolved a systematized curriculum and training, supervised by training committees, who planned courses for accepted candidates and who designated certain analysts as qualified teachers. This systematic training consisted of supervised or controlled work with clinical cases and theoretical and clinical seminars, in addition to the personal analysis previously utilized.

As a result of these developments, training institutes were subsequently established in various European centers (London, Vienna, Paris, Budapest) and in the United States at New York (1931) and Chicago (1932). The Boston Psychoanalytic Institute, incorporated in Massachusetts, founded by the Boston Psychoanalytic Society in October, 1935, and under its supervision, is the third of such training institutes in American cities.

The aim of the Boston Psychoanalytic Institute is to provide a center of instruction in the field of psychoanalysis and related subjects for such properly qualified individuals as are selected by the Training Committee of the Boston Psychoanalytic Society. Among the future plans of the Institute are the establishment of a clinic for psychoanalytic treatment of patients with moderate means, systematic research in problems of clinical psychoanalysis and lectures for general practitioners.

The Institute is under the supervision of a Board of Trustees elected by the Boston Psychoanalytic Society, the majority of the members of this Board being selected from the Educational (Training) Committee of the Society. The trustees of the Institute are as follows: William Barrett, M.D.; Isador H. Coriat, M.D.; Leola Dalrymple, M.D.; William Healey, M.D.; M. Ralph Kaufman, M.D.; John Murray, M.D.; Martin W. Peck, M.D. Dr. Hanns Sachs and Dr. Helene Deutsch are members of the advisory board.

The activities of the Institute consist of lectures and clinical and theoretical seminars on psychoanalysis given to properly qualified individuals. Some of these courses and seminars are obligatory for all candidates in training. Among the courses offered are seminars on clinical psychoanalysis, technique, instincts, psychoanalytic psychiatry,

dream interpretation, child analysis, Freud's writings, lectures on problems of adolescence, etc. The Institute thus offers a postgraduate training for physicians who wish to specialize in psychoanalysis and also gives opportunities for training, in various nontherapeutic applications of analysis, to those engaged in professional fields allied to medicine. The instruction at the Institute is given by training analysts who are appointed by the Educational Committee of the Boston Psychoanalytic Society. Admission to membership in the Society is open only to those who have satisfactorily completed the required training at the Boston or some other Institute which is recognized by the International Psychoanalytic Association.

Dr. M. Ralph Kaufman, Riverbank Court Hotel, Cambridge, Mass., is chairman of the Educational Committee to whom all inquiries should be addressed.

RÉSUMÉ OF COMMUNICABLE DISEASES IN MASSACHUSETTS FOR MARCH, 1936

Disease	Mar., 1936	Mar., 1935	5 Yr. Average*
Anterior Poliomyelitis	—	—	2
Chickenpox	1,137	1,149	1,145
Diphtheria	22	29	109
Dog Bite	677	716	396
Epidemic Cerebrospinal Meningitis	39	9	7
German Measles	816	5,120	1,156
Gonorrhea	485	513	503
Lobar Pneumonia	768	501	537
Measles	3,975	1,874	3,461
Mumps	2,477	532	872
Paratyphoid	1	—	—
Scarlet Fever	1,307	1,066	1,630
Syphilis	492	556	423
Tuberculosis, Pulmonary	280	311	390
Tuberculosis, Other Forms	44	38	44
Typhoid Fever	5	6	7
Undulant Fever	4	2	—
Whooping Cough	399	777	1,164

*Based on the figures for the preceding 5 years.

RARE DISEASES

Anthrax was reported from Lynn, 1; Saugus, 1; total, 2.

Diphtheria was reported from Boston, 8; Bridgewater, 2; Brockton, 1; Hanover, 1; Lowell, 3; Millbury, 1; Newton, 1; Quincy, 1; Revere, 1; Somerville, 1; Waltham, 1; West Bridgewater, 1; total, 22.

Encephalitis lethargica was reported from Boston, 1; Saugus, 1; total, 2.

Epidemic cerebrospinal meningitis was reported from Ashland, 1; Belmont, 1; Boston, 18; Bourne, 1; Bridgewater, 4; Cambridge, 1; Dracut, 1; Easthampton, 3; Hull, 1; Lincoln, 1; Natick, 1; Quincy, 1; Somerville, 2; Southboro, 1; Springfield, 1; Whitman, 1; total, 39.

Pellagra was reported from Boston, 1; Waltham, 1; total, 2.

Septic sore throat was reported from Beverly, 1; Boston, 9; Concord, 1; Danvers, 1; Easthampton, 1; Gardner, 5; Georgetown, 1; Lynn, 2; Malden, 1; Melrose, 1; Petersham, 4; Somerville, 1; total, 28.

Trachoma was reported from Boston, 1; Cambridge, 1; Malden, 1; total, 3.

Trichinosis was reported from Boston, 4.

Typhus was reported from Chelsea, 1.

Undulant fever was reported from Ashby, 1; Boston, 1; Bourne, 1; Conway, 1; total, 4.

Diphtheria and pulmonary tuberculosis had their lowest reported March morbidity in the history of the State.

Epidemic cerebrospinal meningitis. Exclusive of twenty-two cases which occurred at two institutions, the balance of seventeen is higher than for any March since 1930, with practically all sections of the State represented.

Undulant fever continues to be reported more frequently than in previous years.

Lobar pneumonia morbidity remained above the five-year average.

The incidence of typhoid fever to date is somewhat higher than in 1935, although the monthly figure fell below the previous year for the first time.

Since last August the reported incidence of mumps has been the maximum recorded for the State.

Scarlet fever morbidity is running above both the 1934 and 1935 figures, but well below 1932 and 1933.

Whooping cough had its lowest reported March incidence since 1917.

The reported incidence of German measles remained higher than usual, but not to compare with the epidemic figures of 1935.

The reporting of anterior poliomyelitis, chickenpox, measles, and tuberculosis other forms was not remarkable.

HEALTH OFFICERS' MONTHLY STATEMENT OF VENEREAL DISEASES REPORTED IN NEW ENGLAND FOR FEBRUARY, 1936

State	Syphilis		Gonorrhea	
	Cases Reported During Month	Monthly Case Rates per 10,000 Population	Cases Reported During Month	Monthly Case Rates per 10,000 Population
Connecticut	204	1.23	114	.69
Maine	23	.29	53	.66
Massachusetts	426	.98	396	.91
New Hampshire	12	.26	13	.28
Rhode Island	158	2.24	59	.84
Vermont	12	.33	11	.30

—*Public Health Service.*

THE CERTIFICATION OF MASSACHUSETTS PSYCHIATRISTS

The American Board of Psychiatry and Neurology has certified a list of twenty-six Massachusetts physicians as qualified to practice this specialty. The list is as follows: Clarence A. Bonner, Ralph M. Chambers, Roderick B. Dexter, Lonnie O. Farrar, Winfred Overholser, Harlan Paine, Harry C. Solomon, Charles E. Thompson, Geneva Tryon, C. Macfie Campbell, James V. May, Joseph E. Barrett, Gaylord P. Coon, Frederick LeDrew, Jackson M. Thomas, David Rothschild, and Purcell G. Schube.

CORRESPONDENCE

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Illinois,
May 1, 1936.

New England Journal of Medicine,

In addition to the articles enumerated in our letter of April 1 the following have been accepted:

Cheplin Biological Laboratories, Inc.
Mercury Salicylate, 1 Grain (0.065 Gm.) Suspended in Oil, 1 cc.

National Drug Co.
Refined Tetanus Toxoid (Alum Precipitated)

Scientific Sugars Co.
Kinney's Cod Liver Oil Concentrate Capsules
Kinney's Cod Liver Oil Concentrate Liquid

G. D. Searle & Co.
Ampoules Bismuth Sodium Tartrate—Searle, 3 per cent, 2 cc.
Solution Bismuth Sodium Tartrate — Searle, 3 per cent, 60 cc. vial

Sharp & Dohme, Inc.
Antipneumococcic Serum Types I and II

United States Standard Products Co.
Bismuth Salicylate in Oil
Scarlet Fever Streptococcus Toxin for the Dick Test

Winthrop Chemical Co., Inc.
Granules Protargol Compound

PAUL NICHOLAS LEECH, *Secretary,*
Council on Pharmacy and Chemistry.

UNDULANT FEVER

A LETTER TO DOCTORS

The Commonwealth of Massachusetts
Department of Public Health
State House, Boston
April, 1936.

During 1935, forty-two cases of undulant fever, one of which was fatal, were reported in Massachusetts. These cases occurred, with one or two exceptions, among users of raw milk, the cases being confined to those sections of the State where such milk is still sold. Unquestionably these figures, which are a distinct increase over those of previous years, do not represent the total incidence of this disease which has become the principal milk-borne infection in this State. Already in 1936 more cases have been reported than for the corresponding period of last year. Although the disease is rarely fatal, it is frequently extremely crippling, the patient being incapacitated for a period of months.

Such infections are usually contracted from the consumption of raw milk from infected herds. The only other source of infection is through contact with infected animals, this hazard being limited obviously to those whose occupation brings them into such contact. The prevention of the disease in animals is not yet possible, inasmuch as surveys of the State show a very high proportion of the cattle to be infected. If undulant fever is to be prevented, therefore, it is essential that all those milk supplies where pasteurization is feasible be so protected.

The united support of the medical profession is essential in any program toward improvement of the milk supplies. In some sections, however, there has been hesitation in recommending pasteurization because of a feeling that this procedure might impair the food value of the milk. This Department is not aware of any scientific evidence to support such a belief. Numerous studies have been made on this subject, all of which show an unimpaired food value. In order that some of this evidence may be brought before you so that you may form an independent opinion on the subject, the Department is sending herewith reprints regarding this subject and will send additional reprints when and as they are available.

Very truly yours,
HENRY D. CHADWICK, M.D.,
Commissioner of Public Health.

EDITORIAL NOTE: Enclosed with this letter were two reprints* by Leslie C. Frank and others of the United States Public Health Service emphasizing the food value of milk and the necessity of boiling or pasteurizing it in order to guarantee its safety.

*Frank, Leslie C.: What every person should know about milk. Public Health Reports (Dec. 14) 1934.

*Frank, Leslie C.; Clark, F. A., Haskell, W. H., et al.: Do children who drink raw milk thrive better than children who drink pasteurized or other heated milk? Public Health Reports (Sept. 23) 1932.

RECENT DEATHS

KONIKOW—MOSES J. KONIKOW, M.D., of 726 Washington Street, Brookline, Massachusetts, died April 26, 1936. Dr. Konikow was born in Russia in 1868. After a preliminary education there and in Switzerland, he was given his M.D. degree by the University of Berne, Switzerland, in 1893, and came to Boston in the same year. He joined the Massachusetts Medical Society in 1894 and retired in 1933.

A widow, two sons and three daughters survive him.

REYNOLDS—JOHN TIMOTHY REYNOLDS, M.D., of Quincy, Massachusetts, died at the New England Baptist Hospital, Boston, April 28, 1936, after a short illness.

Dr. Reynolds was born in Winchester, Massachusetts, the son of Mr. and Mrs. Richard Reynolds, and, after graduating from Holy Cross College, studied at the Baltimore Medical College and received his M.D. degree in 1905.

He was the founder of the Reynolds Hospital in Quincy and was a Fellow of the Massachusetts Medical Society and the American Medical Association.

Three sons, Richard Reynolds of Washington, John Reynolds, Jr., and Lawrence Reynolds, both of Quincy, and four daughters, Mrs. Margaret Bianchi of Braintree, Mrs. Eleanor Reilly of Milton and the Misses Barbara and Rosemary Reynolds, of Quincy, survive him.

Mrs. Reynolds died two years ago.

MORRISON—ARCHIBALD BENJAMIN MORRISON, M.D., of 1493 Beacon Street, Brookline, Massachusetts, died at his home, May 3, 1936, after an illness of two years.

Dr. Morrison was born in Inverness County, Nova Scotia, in 1864.

He graduated from the College of Physicians and Surgeons of Baltimore in 1906, and, for the succeeding ten years, served at the Boston City Hospital. While there he joined the Massachusetts Medical Society in 1906. After leaving the City Hospital, Dr. Morrison practiced in Deer Isle, and China Maine, but after a few years returned to Massachusetts and located in Brookline.

His practice was confined to otolaryngology and ophthalmology.

Dr. Morrison is survived by his widow, Mrs. Carrie E. (Brown) Morrison, and a daughter, Miss Enid Morrison.

NOTICES

STAFF ROUNDS AT THE PETER BENT BRIGHAM HOSPITAL

On Saturdays in the wards of the Peter Bent Brigham Hospital from 10:00 to 12:00, Staff Rounds will be conducted by Dr. Henry A. Christian, Physician-in-Chief, Hersey Professor of the Theory and Practice of Physic at the Harvard Medical School. To these, practitioners and medical students are cordially invited.

SURGICAL LECTURES AT THE PETER BENT BRIGHAM HOSPITAL AMPHITHEATRE

Dr. K. H. Giertz, Surgeon-in-Chief, Sabbatsbergs Sjukhus, Stockholm, Surgeon-in-Chief Pro Tempore, Peter Bent Brigham Hospital.

May 18, 1936, Monday, 2-4 P.M. Twenty-Five Years of Experience in the Treatment of Peritonitis.

May 20, 1936, Wednesday, 2-4 P.M. Thrombo-Embolic Disease and Its Surgical Treatment.

May 25, 1936, Monday, 2-4 P.M. Development of Respiratory Apparatus for Thoracic Surgery.

All students and doctors will be welcome.

TWO WORTHY INDIGENT PHYSICIANS

The sister of a reputable physician has notified this Journal of two elderly women physicians living together, one a member of the Massachusetts Medical Society and the other a former member, who are suffering for want of the comforts of life.

If anyone is interested in contributing money or food for these women, the facts are available at the office of this Journal.

HOSPITAL ADMINISTRATION

Dr. Joseph C. Doane, Medical Director of the Jewish Hospital, Philadelphia, has arranged to give a short course in hospital operation this summer at Cornell University, June 29 to July 11.

Students will devote all of their study time to hospital problems. The plan is to give executive instruction in the latest and generally endorsed methods for promoting efficient and economic administration of hospital problems.

Full information can be obtained on application to Professor Howard B. Meek of Cornell University, Ithaca, New York.

REPORTS AND NOTICES OF MEETINGS

WORCESTER NORTH DISTRICT MEDICAL SOCIETY

The seventy-seventh annual meeting of the Worcester North District Medical Society was held at Burbank Hospital Wednesday, April 22. Dr. George P. Norton, president, presided. The invocation was given by Rev. A. Vincent Bennett, rector of Christ Episcopal Church.

The annual election of officers resulted as follows: President, Dr. Sherman Perry, Winchendon; vice-president, Dr. James F. Cuddy of Athol; secretary, Dr. Francis M. McMurray; treasurer, Dr. Frederick H. Thompson, Jr.; councilors, Dr. Thomas R. Donovan, Dr. Richard A. Morgner, Dr. Harry R. Nye and Dr. Charles J. Laserte, both of Leominster, and Dr. Albert F. Lowell of Gardner; censors, supervisor, Dr. T. Donovan, Dr. Edward A. Adams, Dr. F. H. Thompson, Jr., Dr. Bartholomew P. Sweeney of Leominster, Dr. Alfred A. Wheeler of Leominster; delegates for nomination of state officers, Dr. G. P. Norton; alternate, Dr. John H. Kearney; commissioner of trials, Dr. Nye of Leominster.

The report of the treasurer, Dr. F. H. Thompson, Jr., showed a cash balance of $308.22.

Among those present who spoke were Mayor Robert E. Greenwood, who extended the greetings of the city; Dr. Howard M. Clute, Boston surgeon, and Richard Bullock, superintendent of the hospital.

Dr. Nye made a report of the committee on pub-

lic relations and Dr. Frederick H. Thompson, Sr., gave a résumé of the activities of the Fitchburg cancer clinic.

The annual oration was delivered by Dr. Clifford L. Derick of Boston, associate professor at Harvard University and a nonresident consulting physician at Burbank Hospital. His subject was "Staphylococcus Infection and Its Treatment."

A steak dinner was served by the hospital authorities and a rising vote of thanks was given to the superintendent and trustees of the hospital for the courtesy and facilities of the hospital for the meeting.

Dr. Norton in closing spoke of the pleasure he enjoyed as president during the past year and thanked the members for their attendance and assistance given him. The secretary reported the deaths of two members during the year, Dr. H. W. Ellam of Gardner and Dr. Edward G. Fosgate of Ashburnham.

MASSACHUSETTS MEMORIAL HOSPITALS

There will be a luncheon meeting of the Surgical Section in the Aid Association Room, ground floor, Talbot Memorial, 82 East Concord Street, Boston, on Friday, May 8, 1936, at 12 noon.

"Massive Torsion of the Mesentery of the Small Intestine"—A Case Report presented by Dr. Ensio K. F. Ronka.

Surgical deaths during April will be discussed.

MILO C. GREEN, M.D., *Secretary.*

THE SOUTH END MEDICAL CLUB

The next regular meeting of the South End Medical Club will be held at the office of the Boston Tuberculosis Association, 554 Columbus Avenue, Boston, on Tuesday, May 19, 1936, at 12 noon. The speaker will be Howard B. Sprague, M.D., Assistant Physician, Massachusetts General Hospital; Visiting Physician, House of the Good Samaritan; Assistant in Medicine, Harvard University Medical School, Courses for Graduates. His subject will be Failure of the Circulation. All physicians are cordially invited to attend. Luncheon will be served at 1 o'clock.

HARVARD MEDICAL SOCIETY

The next meeting of the Harvard Medical Society will be held in the Peter Bent Brigham Hospital Amphitheatre (Shattuck Street Entrance), Tuesday evening, May 12, at 8:15 P.M.

PROGRAM

Presentation of Cases.

Development of the Cells of the Blood and Bone Marrow. By Florence R. Sabin, M.D., Member, Rockefeller Institute for Medical Research, New York City.

Medical students and physicians are cordially invited to attend.

MARSHALL N. FULTON, M.D., *Secretary.*

NORFOLK DISTRICT MEDICAL SOCIETY

EIGHTY-SIXTH ANNUAL MEETING

The annual meeting of the Norfolk District Medical Society will be held at the Woodland Golf Club, West Newton, on May 12.

ORDER OF EXERCISES

Business Meeting: 7:00 P.M.

1. Minutes of Previous Meeting.
2. Report of the Treasurer.
3. Reports of Committees.
4. Election of Officers.
5. Incidental Business.

Dinner: 8:00 P.M.

Following the dinner there will be an Illustrated Lecture by Commander Donald B. MacMillan, noted Arctic explorer.

Commander MacMillan's lecture will be a general talk on the Arctic regions illustrated by means of both still and motion pictures. It will include many of his unusual experiences with Peary in his polar expeditions as well as a wealth of material based upon his own expeditions in the exploration of these regions. Commander MacMillan is an intensely interesting and able speaker and your Executive Committee urges you to make a special effort to attend.

In accordance with our recent custom, members are invited to have ladies accompany them. Dinner tickets for members will be $1.50 and for their guests $2.50. Please notify the secretary not later than Saturday, May 9, as dinner reservations must be made with the club management in advance.

GOLF

Members are invited to enjoy the privileges of the links during the entire day.

LEIGHTON F. JOHNSON, M.D., *President,*
FRANK S. CRUICKSHANK, M.D., *Secretary.*
1247 Beacon Street, Brookline.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

The Annual Meeting of the Essex South District Medical Society will be held Wednesday, May 13, 1936, at the Salem Country Club.

Dinner at 7:00 P.M.

Speaker: Dr. Paul White.

Subject: "A Medical Pilgrimage to Ancient Greece and Medieval Italy"; with moving pictures.

HANFORD CARVELL, M.D., *President.*
R. E. STONE, M.D., *Secretary.*

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

CALENDAR OF BOSTON DISTRICT FOR THE WEEK BEGINNING MONDAY, MAY 11, 1936

Monday, May 11—

9 A.M. Massachusetts General Hospital. Orthopedic Clinic.

Tuesday, May 12—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Clinical Preventive Medicine. Dr. Robert W. Buck.

9:30 A.M. Massachusetts General Hospital. Thoracic Clinic. Ether Dome.

2:30 P.M. Pediatric Ward Visit. Massachusetts Eye and Ear Infirmary.

*8:15 P.M. Harvard Medical Society. Peter Bent Brigham Hospital Amphitheatre (Shattuck Street Entrance).

Wednesday, May 13—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Hospital Case Presentation. Dr. S. J. Thannhauser.

†12 M. Clinico-Pathological Conference. Children's Hospital.

2 P.M. Massachusetts General Hospital. Psychiatric Clinic. Out-Patient Department Amphitheatre.

Thursday, May 14—

*8:30-9:30 A.M. Clinic, Surgical Staff of the Peter Bent Brigham Hospital, at the Peter Bent Brigham Hospital.

9 A.M. Massachusetts General Hospital. Surgical Grand Rounds. Amphitheatre.

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Effect of Protamine Insulinate on the Blood Sugar, Case Presentation. Dr. Harry Blotner.

11 A.M. Massachusetts General Hospital. Medical Grand Rounds. Ether Dome.

12 M. Massachusetts General Hospital. Clinico-Pathological Conference.

Friday, May 15—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Thyroid and Psyche. Dr. James H. Means.

10:30 A.M. Massachusetts General Hospital. Fracture Rounds.

*12 M. - 1 P.M. Boston University School of Medicine Surgical Clinic, Boston City Hospital. Cheever Amphitheatre.

Saturday, May 16—

*9-10 A.M. Boston Dispensary, 25 Bennet Street, Boston. Hospital Case Presentation. Dr. S. J. Thannhauser.

*10 A.M. - 12 M. Staff Rounds at the Peter Bent Brigham Hospital. Conducted by Dr. Henry A. Christian.

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*Open to the medical profession.
†Open to Fellows of the Massachusetts Medical Society.

May 7—Faulkner Hospital Clinical Meeting at 5 P.M.

May 8—Massachusetts Memorial Hospitals, Luncheon Meeting, Surgical Section. See page 958.

May 11—American Medical Golfers Play in Kansas City. See page 710, issue of April 2.

May 11—American Association for the Study and Control of Rheumatic Diseases. See page 811, issue of April 16.

May 11-12—Annual Joint Meeting of the American Association of Medical Milk Commissions and Certified Milk Producers. See page 852, issue of April 23.

May 12—American Heart Association, Inc. See page 712, issue of April 2, and page 901, issue of April 30.

May 12—Harvard Medical Society. See page 958.

May 12-16—The International Congress of Physical Medicine. See page 443, issue of February 27.

May 15—Boston University School of Medicine Surgical Clinic, Boston City Hospital. See page 901, issue of April 30.

May 16—Staff Rounds at the Peter Bent Brigham Hospital. See page 957.

May 18—Springfield Medical Association, 8:30 P.M. at the rooms of the Springfield Academy of Medicine, 20 Maple Street. The Development of Medicine in the United States, 1636-1936. Dr. Henry E. Sigerist.

May 18—The American Neisserian Medical Society. See age 811, issue of April 16.

May 18, 20, 25—Surgical Lectures at the Peter Bent Brigham Hospital by Dr. K. H. Giertz. See page 957.

May 19—The South End Medical Club. See page 958.

May 31 - June 1—International Cardiological Meeting, Royat (Auvergne) Assembly of Physiologists, Pathologists and Therapeutists. See page 754, issue of April 9.

June 15-19—The Executive Board of the Catholic Hospital Association will meet at the Fifth Regiment Armory, Baltimore, Md.

June 16-July 28—Summer Course in Bacteriology. See page 385, issue of February 20.

June 29 - July 11—Hospital Administration. See page 957.

September, 1936 — First International Conference on Fever Therapy. See page 1325, issue of December 26, 1935.

September, 1936—First International Congress of Sanatoria and Private Nursing Homes. See page 803, issue of April 16.

September 7-10—International Union against Tuberculosis. See page 554, issue of March 12.

October 19-23—Clinical Congress of the American College of Surgeons. See page 180, issue of January 23.

DISTRICT MEDICAL SOCIETIES

ESSEX NORTH DISTRICT MEDICAL SOCIETY

May 7—Censors' Meeting. See page 863, issue of April 23.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

May 7—Thursday. Censors' Meeting.

May 13—Wednesday. Annual Meeting. Salem Country Club. Dinner at 7 P.M. Speaker: Dr. Paul White. See page 958.

R. E. STONE, M.D., Secretary.
88 Lothrop Boulevard, Beverly.

FRANKLIN DISTRICT MEDICAL SOCIETY

May 12—Weldon Hotel, Greenfield, at 11 A.M.

CHARLES MOLINE, M.D., Secretary.
Sunderland.

NORFOLK DISTRICT MEDICAL SOCIETY

May 12—Annual Meeting. See page 958.

The censors meet for the examination of candidates: May 7, 1936; November 5, 1936.

FRANK S. CRUICKSHANK, M.D., Secretary.
1236 Beacon Street, Brookline.

PLYMOUTH DISTRICT MEDICAL SOCIETY

May 21—Lakeville State Sanatorium.

G. A. MOORE, M.D., Secretary.
167 Newbury Street, Brockton.

SUFFOLK DISTRICT MEDICAL SOCIETY

May 7—Censors' Meeting. 4 P.M. 8 Fenway, Boston.

ROBERT L. DeNORMANDIE, M.D., President,
CHARLES C. LUND, M.D., Secretary.

WORCESTER DISTRICT MEDICAL SOCIETY

May 7—Censors' Meeting. See page 713, issue of April 2.

May 13—Wednesday afternoon and evening. Annual Meeting of Society.

ERWIN C. MILLER, M.D., Secretary.
27 Elm Street, Worcester.

BOOK REVIEWS

From a Surgeon's Journal, 1915-1918. Harvey Cushing. Boston: Little, Brown, and Company. 555 pages. $5.00.

This long-awaited diary, covering March to May, 1915 and March, 1917 to November, 1918, will take its place as one of the outstanding books of the Great War. The author, pre-eminent in the field of surgery, made a distinct place for himself in literature with his "Life of Sir William Osler" published in 1925. He has now given us a glorious account of his war experiences in a day-by-day diary, carefully recording the events he witnessed in his sojourn with the French Army and his longer stay with the British and American Expeditionary Forces.

In 1915 he spent three months with the Ambulance

Américaine at Neuilly as head of the Harvard Unit, with a brief visit to the French Second Army and a hospital at Compiègne. There followed a hurried trip to view the Royal Army Medical Corps in action in Flanders and a few days in war-time England before sailing home in May. Again in 1917 he organized the American Base Hospital No. 5, and, after fighting the "Battle of Boston Common," sailed with his unit for France in May of that year. Once established at Camiers, he was soon off to more dangerous work at Casualty Clearing Station No. 46, operating during the height of the Passchendaele Battles and back for winter quarters at Boulogne. The spring of 1918 found him heavily engaged at the time of the great German offensive, only to be transferred to the American Expeditionary Force to take part in the St. Mihiel and Argonne offensives before returning to America in November, 1918.

Such is a brief outline of the period covered by his almost daily notes. It seems quite likely that no American surgeon saw more of the Great War and certainly no one has given us such a vivid and painstaking account of what went on. Incident upon incident piles in upon the reader until the tragedy, horrors and hardships in rain and mud overwhelm one with confusion and almost hopelessness. This is War. Here is a record, written by a man with clear perceptions, under stress such as seldom comes to anyone, that depicts the medical side of war in an enduring fashion. Shafts of humor tend to lighten the load; old friends are met and new ones made; but the essence of the book lies in its superb pictures of heroism, both in the combatant and noncombatant. No doctor with an ounce of blood in his system can fail to be stirred by this account; nor will he, after reading, fail to pay tribute to the author who has made alive again forgotten memories of those dark days of 1915-1918.

Objective and Experimental Psychiatry. E. Ewen Cameron. 271 pp. New York: The Macmillan Company. $3.00.

This book represents a feeble attempt in a good cause. The author's aim is apparently to collect and review methods and data offering an objective, quantitative and experimental approach to psychiatry. The mental and emotional states that characterize clinical psychiatry find no place in this presentation, apparently excluded by the author's interpretation of the term "objective" psychiatry. Such data as are presented concern the psychoses almost exclusively. There is strikingly little reference to the psychoneuroses, personality maladjustment and delinquency.

The first two chapters point out some of the special difficulties encountered in the application of the scientific approach to the subject matter of psychiatry. These chapters are rambling and not constructive. A good deal of space is allotted to the discussion of "psychic pain" without any adequate definition or description of this concept.

The bulk of the book is concerned with reviews of various studies and tests which have found application in the investigation of behavior. The chapters are by no means exhaustive and bibliographies are incomplete. Little attempt is made to evaluate the material critically. Among the better chapters are those on Tests of Intelligence, Introversion, Extroversion, Respiratory Centre and Schizophrenia. The chapters on Pathology and Conditioned Reflexes are especially incomplete, the last mentioned particularly with regard to the application of conditioned reflexes to human beings and with regard to the discussion of the "psychogalvanic reflex" included in this chapter. Very little is included of material that has been collected on the autonomic nervous system.

Undoubtedly at present there is a serious lack of well-tested objective experimental data in psychiatry. By its very incompleteness, this book tends to emphasize this lack. Unfortunately the book is not scholarly or exhaustive enough to be of help to the investigator. It is doubtful whether it will be of much help or interest to the general practitioner.

Classical Contributions to Obstetrics and Gynecology. Herbert Thoms. 265 pp. Springfield and Baltimore: Charles C Thomas. $4.00.

Dr. Thoms has taken from the literature extracts which cover the wide fields of obstetrics and gynecology. Each contribution is preceded by a brief note giving the essential facts in the life of the author, often accompanied by a reproduction of his portrait, the title page of his book, or an important illustration from the original article. Thus we have in compact form the essentials in the history of this branch of medicine, given to us in a delightful manner. Surely no one interested in the subject, who has the least spark of reverence for the men who have preceded him in the specialty, can afford to miss this important book. Finely issued, it would be an ideal gift and a valuable addition to any physician's library.

Dr. Thoms has divided his work into sections dealing with general obstetrics, the pathology of pregnancy, the operations of obstetrics, puerperal infection, deformities of the pelvis, and gynecology. The world literature has been covered and we find extracts from Soranus, a second-century physician, up to the work of men in the twentieth century. Particularly well organized is the chapter on puerperal infection, covering, as it does, the work of Hippocrates, Gordon, White, Holmes, Semmelweis and Pasteur. Americans will be particularly pleased that credit has been given for the contributions of Walter Channing to the anemias of pregnancy, the work of Holmes on puerperal fever, and the many contributions from this country in gynecology. Led by Ephraim McDowell, the list includes Nathan Smith, Robert Battey, W. L. Atlee, J. M. Sims, and T. A. Emmet, surely a proud record for American medicine.